



# ***JPRS Report***

## **Environmental Issues**

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# Environmental Issues

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11 October 1991

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**Soviet-American Bering Strait Park Project Initiated**

91WN0647E Moscow SOVETSKAYA ROSSIYA  
in Russian 30 Jul 91 p 6

[Article by TASS correspondent V. Trushkov: "A Park at the Edge of the Earth"]

[Text] The establishment of a unique Soviet-American park in the area of the Bering Strait—is this a myth or reality? The Ecology of Man Center, an international nongovernmental organization located in Moscow, states with optimism: yes, this is quite possible. And the people here have started without delay to realize this idea. RSFSR Goskompriroda (State Committee for the Protection of Nature) has supported the innovators.

The center has been the basis for the temporary creative collective of Lengiprogor (Leningrad Branch of the State Institute for the Planning of Cities) which has been put together; it consists of specialists who are working out the biological, ethnosocial, demographic, medico-biological, economic and legal sections of the project. L. Bogoslovskaya, doctor of biological sciences, heads the collective.

"At present a group of our colleagues is working in the area of the Bering Strait," says Lyudmila Sergeyevna Bogoslovskaya. "They are receiving active assistance from the region's Center for the Preservation of the Natural and Historical-Cultural Heritage, as well as from an organization of the indigenous population and the National Audubon Society (U.S.). A parallel international marine expedition to study the waters from the Bay of Provideniya to Pevek is also taking place".

The main tasks of the project are to describe the present state and trends in the numerical development of the terrestrial and marine fauna and to use this information as the basis on which to form concrete proposals on how to preserve biological diversity and protect the gene pools of wild nature and aboriginal varieties of domestic animals. Another important aspect of the work is the study and protection of the historical-cultural and living heritage of this edge of the earth, including the traditional forms of natural resource use.

"We are confident," says the scientific leader of the creative collective, "that all this will contribute to the resolution of the ethnosocial, demographic and medico-biological problems of the indigenous and migrant population, and of the problems of preserving the ethnic structure of the villages. In turn, this should bring with it the socioeconomic development of the region, which encompasses the Chukotskiy and Providenskiy rayons, part of the Iultinskiy Rayons and the adjacent marine waters. The invariable accompaniment of such an upswing is tourism, both intra-Union and international. The success of this entire program will depend on the joint Soviet-American structures for administering the international Beringiya Park, as well as on the participation of the local—especially the indigenous—

population, in the establishment of these structures and the administration of the park.

The interest of international ecological centers, primarily Soviet and American ones, in the establishment of Beringiya Park is more than obvious. It is also symbolic that the plan for this promising program emerged in a year when two great neighbors—the USSR and the United States—are marking an important date, the 250th anniversary of Russian Alaska.

**Japan, Iceland Express Solidarity on Continued Whaling**

OW0209120691 Tokyo KYODO in English 1121 GMT  
2 Sep 91

[Text] Tokyo, Sept 2 (KYODO)—Foreign Minister Taro Nakayama said Monday that Japan and Iceland have a common interest in ensuring the continued practice of whaling, according to Foreign Ministry officials.

The officials said Nakayama made the remarks in a meeting with Iceland's parliamentary Chairwoman Salome Thorkelsdottir, who arrived in Japan earlier in the day as head of a bipartisan delegation of legislators.

An official said Japan and Iceland share the view that whales are "one of the marine resources which human beings can reasonably utilize" as long as they are taken in sustainable numbers.

Japan and Iceland have both come under fire for continuing the practice of whaling from such nations such as the United States and Britain, which say the creatures are being hunted into extinction.

Foreign Ministry sources said Japan has expressed understanding of Iceland's recent decision to leave the International Whaling Commission (IWC).

Japan, which is also member of the commission, at one point last year threatened to leave after its proposal to end a ban on commercial whaling was overwhelmingly defeated.

Japan says the IWC should drop the smallest protected species of whale, the minke, from its list, claiming its numbers are plentiful.

Japan, while claiming to abide by the IWC ban, is currently engaged in so-called "research whaling"—a practice by which whales are killed ostensibly to assess their "reproductive capacity." The whale meat nevertheless finds its way to restaurants in Japan.

Meanwhile, Thorkelsdottir, who earlier in the day paid a courtesy call on Prime Minister Toshiki Kaifu, was quoted as saying that Icelandic Prime Minister Vigdis Finnbogadottir is looking forward to her scheduled visit to Japan next month.

**Denmark, Estonia Sign Environmental Protection Treaty**

*LD0209221191 Moscow TASS in English 2154 GMT  
2 Sep 91*

[By TASS correspondent Aleksandr Sidorov]

[Text] Copenhagen, September 3 (TASS)—Denmark and Estonia signed an environmental protection treaty here on Monday.

Under the treaty, which was signed by the two countries' ministers for environmental issues Per Stig Moller and Tinis Kaazik, the sides commit to exchange information on ecological issues, share their know-how and maintain broad cooperation to solve problems in this area.

To coordinate the two countries' activity, it is planned to set up a special group, which will define the main areas of cooperation, in which Denmark could make the most effective contribution to solving Estonia's ecological problems.

It is envisaged that part of 500 million kroner, which are set aside by Denmark for environmental protection projects in east European countries, will be remitted to the Baltic republics, Ritzaus Bureau, the Danish news agency, reports.

Evaluating the importance of the treaty, Per Moller said it would help tackle acute ecological problems, strengthen ties between the two states and contribute towards Estonia's democratic development.

On Tuesday, the Danish minister will arrive in Lithuania and Latvia to sign similar treaties with these Baltic states.

**Proposals of Draft Convention on Climatic Change Outlined**

*OW1009203091 Tokyo THE DAILY YOMIURI  
in English 10 Sep 91 p 2*

[Text] A draft of the Framework Convention on Climatic Change, to be submitted to an international

meeting beginning Monday in Nairobi, suggests the creation of a world-wide fund to combat global warming.

The draft, disclosed to The YOMIURI SHIMBUN, was compiled by the committee's working group based on opinions from more than 120 countries represented at previous meetings in Washington and Geneva.

The draft to be discussed in Nairobi is expected to be adopted in a convention form at the United Nations Conference on Environment and Development, scheduled next June in Brazil.

The draft makes four suggestions to both industrialized and developing countries for stabilizing gas emissions believed responsible for global warming, including freezing global carbon dioxide emissions at their 1990 levels by the year 2000.

In addition to the four, the draft gives two alternatives aimed at developing countries including one to "commit themselves to appropriate action... and keep future net growth of greenhouse gas emissions at the lowest level possible."

In an effort to help developing countries implement changes, the draft also proposes that an international fund mobilize new financial resources.

The draft also paid consideration to the special situation of developing countries, which are reluctant to cooperate in the reduction of gas emissions because it leads to a curb on their development. It said that priority should be given to the specific needs of countries prone to flooding, drought and desertification.

Taking into account the political and economic changes in Eastern Europe, the draft stated, "An additional degree of freedom to stabilize their economy and modernize their industry and agriculture has to be given to countries with economies in transition."

## ANGOLA

### Systematic Slaughter of Elephants in Huila Province Reported

*MB3008102691 (Clandestine) Voice of Resistance of the Black Cockerel in Portuguese to Southern and Central Africa 0500 GMT 30 Aug 91*

[Text] Senior officers of the People's Armed Forces for the Liberation of Angola [FAPLA] are slaughtering an average of eight elephants every week in Quipungo area, Huila Province. Our Huila correspondent Betty Francisco said yesterday that in their systematic slaughter, the FAPLA officers have been using machine guns, RPG-7 rocket launchers, and highly potent land mines.

According to local sources, elephants in the area face the risk of extinction because of increasing illegal trafficking in ivory by officials of the People's Republic of Angola.

It will be noted that the National Union for the Total Independence of Angola has been preserving wildlife in the Angolan free land.

## BOTSWANA

### Minister Explains Government Policy on Elephant Populations

*MB2108202491 Gaborone Radio Botswana Network in English 1910 GMT 21 Aug 91*

[Text] The minister of commerce and industry, Mr. Ponatshego Kedikilwe, yesterday told visiting European parliamentarians that the government intends to sustain elephants on a sound ecological framework because their are a valuable natural resource.

According to a news release from his ministry, Mr. Kedikilwe told the parliamentarians that in order to achieve this, the policy will be to maintain the elephant population at its [word indistinct] level of approximately 55,000 through culling.

The release further stated that at the meeting there was shared understanding about the need to reduce conflict between elephants and humans, and that one way of doing this is to create employment for local communities, rather than waste the potential elephant products. The release says Mr. Kedikilwe expressed concern at the listing of elephants by the Convention for International Trade in Endangered Species effectively blocks out utilization of their meat, skins, and ivory.

The release says for their part the European parliamentarians indicated appreciation of Botswana's policy on elephant populations, and pledged to assist Botswana in seeking solutions to any problem. In addition the two parties endorsed the need for mutual collaboration in developing an action plan for preserving the black rhino in Africa, and to strengthen regional cooperation in

southern Africa under SADCC [Southern African Development Coordination Conference], EEC, and ACP [African, Caribbean, and Pacific] mandates.

## SOUTH AFRICA

### ESKOM's Environmental Cleanup Efforts Viewed

*91WN0633A Cape Town LEADERSHIP in English Jun/Jul 91 pp 73-80*

[Special report by Giaran Ryan, commissioned by Eskom: "Clearing the Air"]

[Text] Environmental writers delve deeply into the lexicon of abuse when describing Eskom's [Electricity Supply Commission] alleged damage to the environment.

Superlatives are strung together in an impassioned attempt to apportion blame for the unsightly carpet of smog, and its attendant sulphurous stench, which disfigures the skyline of the eastern Transvaal highveld (ETH). Eskom presents itself as a ready target for such abuse: eight of its 25 power stations are located in a relatively small area wedged between the East Rand, Swaziland and the northern border of the Free State, an area noted for its air pollution.

The attacks on Eskom are generally loaded with generalities and are weak on specifics.

Yet a superficial examination of statistics might lead one to conclude that Eskom is indeed the prime culprit in the destruction of the quality of the air over the ETH.

Its power stations consume 45 percent of the coal burnt in South Africa—in 1990, this amounted to 71 million tons. The installed capacity of its 25 power stations countryside was 35,673 megawatts in December 1990, 92 percent of which was coal-fired. More to the point, its eight major power stations located on the ETH account for 64 percent of this coal-fired capacity. It has been claimed that the gaseous emissions and acid rain in this part of the country are worse than those in many of the high-density industrial areas of western Europe and the United States.

It looks like an open and shut case: an unscrupulous utility exploits the environment for all it's worth, and then hastily prepares research documents which exonerate it from blame.

The truth, however, is quite different. In terms of sheer investment, no other corporation in South Africa can boast a more lively commitment to environmental preservation. Electricity, after all, is the cleanest form of power. But generating that power requires the burning of vast amounts of coal and this poses serious potential damage to air and water, two of our primary natural elements. In the early 1970s, Eskom grasped the nettle and embarked on a costly programme to cut down as far as possible its emissions into the atmosphere. Today,

every stage of the production cycle, from the mining of coal through to the supply of raw electricity, is continuously and meticulously scrutinised for possible environmental damage.

This process starts at the top, where an environmental steering committee, accountable to Eskom's chief executive, monitors actual and possible causes of damage to the environment based on an exhaustive collation of statistics; filters down through the organisation to departmental level; and then to the power stations themselves. Each station employs a team charged with monitoring emissions and minimising environmental damage.

The technical services manager of Eskom's generation group, Brian Statham, says Eskom is setting the tone and pace of environmental preservation among South African industries, ahead of statutory requirements. "We were the first public utility in the world using fossil fuels to invite an independent public audit of our environmental programmes," he says.

It was a bold step to allow outside access to its internal environmental control. What if the independent auditors slammed Eskom publicly for some or other lapse of control? The fears were unfounded. Eskom's public image as a corporation that was genuinely concerned about its environmental responsibilities was greatly enhanced by this exercise. The auditing team, headed by accountants and environmental auditors Deloitte Pim Goldby, reported: "By world standards, Eskom is up to date with—and in some cases at the cutting edge of—environmental policy, and within South Africa the corporation is taking a leading role in corporate environmental management."

In order to assess the integrity of Eskom's environmental controls a few steps must be taken back to the actual generation of power. As coal is burnt, noxious gases in the form of sulphur dioxide and various nitrous oxides are emitted, as well as large amounts of ash. Coal-fired stations also emit carbon dioxide, a gas which aggravates global warming. For every 1,000 tonnes of coal burnt, 200-400 tonnes of ash is produced. In the 1960s relatively little concern was shown for the environment and much of this ash was simply pumped into the air, although in mitigation it can be argued that technology was insufficiently advanced to tackle the problem.

A major technological breakthrough occurred in the mid-1970s when electrostatic precipitators were introduced in power stations, resulting in a dramatic improvement in air quality. These precipitators electrically charge the rising ash, causing it to stick to electrostatic plates. As a result, more than 99 percent of the ash is extracted from the airflow and may be collected and removed. The precipitators were so successful in removing the ash, which had coated the surrounding farmlands with substances vital to agriculture such as potassium, that farmers were moved to complain over the suspension of this free fertilising service.

The precipitators cost R20 million each. To replace Lethabo power station's six precipitators cost R120 million, and the replacement value of all Eskom's precipitators around the country is over R1 billion.

While the precipitators may have removed the ash from the rising plume, the problem of dispersing noxious gases still exists. When coal burns it produces large quantities of sulphur dioxide, nitrous oxide and carbon dioxide. Eskom uses tall stacks (some as high as 300 metres) to ensure that these gases are dispersed above the highveld's surface inversion layer, a stable layer of air about 300 metres above the ground which tends to trap the air beneath it, preventing it from mixing with the more unstable air above.

This inversion layer is most readily apparent on winter mornings or in early winter evenings when it traps a blanket of smog close to the ground. The inversion breaks up during the day under the heating action of the sun, allowing emissions to be dispersed in higher layers of air and diluted to low concentrations. Eskom's tall stacks on the ETH release their plumes well above the inversion layer from where prevailing winds disperse it over the Free State in summer and over Natal and the Indian Ocean in winter.

So what are the origins of pollution on the ETH? Eskom continually monitors the quality of the air over the entire country. Dr Steven Lennon, Eskom's scientific investigations manager, says by applying apportionment studies to Eskom's data it has been able to reliably estimate its contribution to the degradation of air on the ETH.

Some of these findings were presented to the World Energy Council Forum in Harare last year in a paper entitled "Eskom's Air Quality Impacts—A Regional Perspective". Written by Lennon and Eskom colleagues Turner, Tosen, Blackbeard, the study attempted to place in a proper scientific perspective emissions from Eskom power stations on the ETH.

The Department of Health has established guideline values for gaseous emissions, based on overseas experience. For sulphur dioxide, the guideline is 30 parts per billion (ppb) per year. Figure 1 [not reproduced], reproduced from the Eskom scientists' paper, shows that the highest ambient level of sulphur is found in Soweto, where it is approaching the department's maximum guideline. The reason is that despite advances in electrification, coal-fires are still preferred for cooking.

The ETH has an ambient sulphur dioxide concentration of 10 ppb compared to about 8 ppb for the Vaal Triangle. According to the apportionment studies, Eskom accounts for 43 percent of this, 30 percent is background, and 28 percent comes from low-level sources such as coal-dumps and industries. Eskom therefore accounts for almost half the sulphur dioxide found in the ETH, but the levels of the gas are too low to cause damage to humans and vegetation. These also compared favourably to conditions elsewhere in the world—the sulphur

dioxide emission density in the ETH is only one-sixth that of West Germany's industrial heartland, the Ruhr.

Regarding particulates (ash), the air over the ETH is relatively pure compared to that over the Vaal Triangle and Soweto (Figure 2 [not reproduced]) and is way below the Department of Health's guideline of 150 micrograms per cubic metre. Apportionment studies show that Eskom accounts for less than 25 percent of it—which illustrates just how effective the precipitators are. Sulphur dioxide concentrations in the ETH showed an increase of about 15 percent between 1984 and 1988, more or less in line with the increase in electricity generated over the period.

Eskom, however, is not being complacent. To further enhance the performance of its precipitators, Eskom is investing R100 million in a flue gas conditioning programme and other methods of reducing emissions are continually being explored.

On occasion, the Department of Health guideline value of 300 ppb for hourly mean ambient concentrations of sulphur dioxide is exceeded on the ETH. "This is due to the combined action of all the regional sources," says Lennon. "However, this only occurs about once in 11 months and is not considered serious. In Soweto, the guideline is exceeded about once every two months."

In the Vaal Triangle, sulphur dioxide concentrations decreased by about 14 percent between 1984 and 1988, despite the commissioning of the Lethabo power station. This decrease is ascribed to the decommissioning of the old Vaal and Klip power stations with their short stacks, and the mothballing of Taaibos and Highveld. Yet research conducted jointly by the Medical Research Council, Eskom and other industries in the Vaal Triangle has shown that air in Vereeniging exceeds US health standards 21 percent of the time, in Vanderbijlpark 51 percent of the time, and in Sebokeng 100 percent of the time.

The pollution was found to come from factory emissions, dust, and coal-fires, particularly in Sebokeng. Sasolburg is also located in the area.

Eskom's environmental efforts are largely focused on the ETH. The Vaal Triangle is a secondary issue as far as Eskom is concerned, as its Lethabo power station is fitted with six electrostatic precipitators and has been shown to contribute relatively little to air pollution.

While this may sound good for Eskom, there is a perception that residents of the ETH are still no better off. The quality of the air may look fine in a statistical survey, but conditions are pretty grim on the ground.

Clive Turner, an Eskom environmental scientist and one of the authors of the "Regional Perspective" paper, says: "The characteristic rotten-egg smell on the Highveld in winter is from hydrogen sulphide which does not come from power stations. The smell becomes noticeable in

very small concentrations of about three parts per billion, and this does not mean that the tall stacks are not dispersing the gases effectively."

Eskom cannot manage the environment on its own. There are too many other contributors to the national pollution problem. For this reason, Eskom is promoting the concept of a national forum on pollution to bring industry together in a spirit of self-regulation.

One of the major areas of concern to Eskom is the potential damage to the environment caused by the mining of coal which is used to fire the power stations' furnaces. Coal is a cheap and abundant source of energy in South Africa and, given the lack of suitable water-courses for hydroelectric schemes, it remains the best available option. Eskom established South Africa's first large open-cast strip mines and, acutely aware of the potential damage this could cause to the environment, joined forces with the Chamber of Mines in drawing up guidelines for the rehabilitation of these mines to farming land. Land which was originally valued at R2,000 to R3,000 per hectare is now being rehabilitated at a cost of R50,000 to R60,000 per hectare, which begs the question: would this money not have been better used to establish irrigation schemes and farming areas elsewhere in the country?

The average sulphur content of Eskom's coal is only one percent, very low by world standards, and the ash content is 27 percent.

The burning of the coal produces large volumes of ash, and various methods of utilising this ash are being explored. In some instances, the ash is heaped into dumps with flat tops which are covered in topsoil. Eskom cooperated with the Chamber of Mines in developing various strains of grass which would grow on these dumps. But just as the old gold mine dumps were reprocessed when better ways were found of extracting gold, the ash dumps are also being put to commercial use.

Rotek is a group of Eskom companies that have hived off from the corporation to operate commercially. One of its subsidiaries, Ash Resources, has linked up with various cement companies to examine commercial applications for the ash waste. The ash can be used as a cement extender, in road-building, and for manufacturing breeze-blocks for buildings. It may also be used as fertiliser, as its alkaline properties largely eliminate the need to lime soil, and Ash Resources is also exploring commercial possibilities along these lines. The ash can also be used in toothpaste and as an anticorrosive agent for underground pipes. Thus a commodity which has been considered an environmental nuisance will soon be put to commercial use.

One of the raw materials used in greatest volume to generate electricity is water, which is converted into steam and used under high pressure to drive the turbo generators. It is Eskom policy to recycle all this water, and these closed reticulation systems require on-site

water treatment plants. In the 1960s, water was chemically cleaned and then discharged. Today, water is cleaned of impurities when it first enters the system and recleaned after each cycle through the system. The result is that water consumption by the corporation as a whole has dropped from five litres per kilowatt hour in the 1970s to just below two litres. Dry-cooled towers require about one-fifth the water used in a wet-cooled station. After a period, the water in the power station is purged onto an ash waste dump and fresh water introduced.

Eskom's Drakensberg pump storage station is a show-piece of environmental planning. It is a hydroelectric station with an installed capacity of 1,000 MW, buried inside the mountain beneath the Sterkfontein Dam. During peak hours, water is released through large tunnels to generate electricity, and during quiet periods the turbines are used to pump water from the Tugela River back to the Sterkfontein Dam. Coal-fired power stations predominate in South Africa because our hydro resources are so limited.

Another emotive issue is nuclear power. Eskom has one nuclear power station, located at Koeberg, some 40 kilometres north of Cape Town on the West Coast. Africa's sole nuclear power station, it has an installed generating capacity of 1,930 MW. The nuclear industry is the most regulated industry in the world, and the design and construction of nuclear power stations and generation systems are strictly controlled to ensure safety in the event of every conceivable form of equipment failure, human error and natural disaster.

Koeberg's environmental laboratories have been tested by overseas monitoring bodies and in one test was found to be the most reliable in the world. Spent radioactive fuels are vitrified or combined with synthetic rock to give it extra durability before being sealed in stainless steel containers which are, in turn, sealed in concrete. These containers are then deposited at a site managed by the Atomic Energy Corporation.

Acid rain has been whipped up into an emotive global issue, and nothing excited greens activists more than the prospect of losing forests to this scourge. Environmentalists at Eskom are not convinced that their corporation has a problem in this regard. In South Africa, the issue of acid rain is frequently distorted and exaggerated. In an effort to garner support for more environmental controls, a member of parliament recently described the rain in certain parts of the country as "pure acid", with a pH value of four.

"The acid rain problem has been misrepresented in South Africa," says Lennon. "Rains in the South African interior are naturally acidic. We are often criticised for causing acid rain, which isn't true."

A pH value of seven is neutral; above this, water is alkaline, and below, acidic. A swimming pool normally has a pH value of between 7.2 and 7.6—in other words, it is slightly alkaline. Inland rain in South Africa has a background pH value of 4.5. In the ETH the rating is 4.0,

and at the Natal/Free State border, 4.3. This means that emissions in the ETH increase the acidity of rain by less than 10 percent.

"No evidence exists that acid rain has had any effect whatsoever on forests in the eastern Transvaal," says Lennon. "Based on five years' complete data, the sulphate and nitrate deposits have no measurable trend. The acidity has been decreasing with increasing rainfall quantities."

Nevertheless, does the extent of sulphate and nitrate deposits on the ground and sulphur dioxide and nitrous oxide in the air warrant further capital investment by Eskom to further cut down its distribution of these substances? No, says Eskom, on two counts.

Firstly, statistics show that sulphur dioxide and nitrous oxide concentrations on the ETH are well below the Department of Health guidelines. Secondly, desulphurising its power stations would be hugely expensive—R1 billion to instal a desulphurisation plant in one 3,600-MW power station alone. This would significantly increase the costs of generating electricity.

Lennon points out that this sum could be used to electrify about 420,000 homes, equivalent to a township the size of Sebokeng and Sharpeville combined, and argues it would be better spent in this way. While he acknowledges that sulphur emissions in the townships may never be completely eliminated, due to the cost of electric appliances and the prevalence of traditional practices, a R1 billion investment in electrification would reduce by as much as 64 percent sulphur and ash concentrations in existing townships in the PWV. By contrast, installing desulphurisation plants will have minimal impact on the ambient sulphur dioxide concentrations in the ETH. "Fitting a desulphurisation plant to one of the ETH power stations would reduce rainfall acidity by 2.3 percent and sulphur dioxide concentrations by 6.9 percent," says Lennon. "These changes would be insignificant. The population of the entire ETH is under 200,000, and existing pollution levels do not pose any risk."

Eskom is investigating charges that air pollution produces corrosion. Evidence to date shows that corrosion on the ETH is much less than in coastal areas, and where corrosion has occurred it has been specific to areas with considerable emissions from short stacks. Similarly, there is no evidence to suggest that acid rain has damaged crops, since normal agricultural practices in the ETH have been shown to acidify the soil by up to 70 times more than atmospheric deposits.

Environmental research is by its nature forward-looking. Its entire thrust is to conserve the earth for future generations by ensuring that the elements necessary to sustain life are not depleted by its current inhabitants. For this reason, Eskom's power generation and environmental planning stretches well into the next century. But current trends determine the needs of the more immediate future.

The slowdown in economic growth over the last few years has led to a lower demand for electricity. From an average 7-8 percent annual growth in demand in the early 1980s, growth has slowed to 3.9 percent over the last five years. The result is that Eskom has a surplus generating capacity of 4,686 megawatts, and since 1989, 5,260 megawatts of plant has been either mothballed or reserve-stored at Taaibos, Highveld, Ingagane, Komati, Grootvlei and Camden.

Indeed, one may ask whether Eskom will ever build another power station in South Africa. Zaire is currently investigating a massive hydroelectric power station on the Zaire River at Inga, with a generating capacity of 140,000 megawatts (compared with South Africa's total installed capacity of 35,000 megawatts). If you consider that the whole of Africa currently consumes about 60,000 megawatts, the electricity flowing from such a scheme would serve the whole continent until well into the next century.

It is not yet certain that this scheme will go ahead, as its planned generating capacity far exceeds current demand and as a vast amount of capital will be required to build the plant and power grids. But any future plans for new power stations in South Africa will be made in the light of Eskom's proposed southern African grid, and considerable surplus capacity currently exists in the region.

Eskom is also preparing for a greener future. It is conducting pilot tests on alternative sources of energy, including wind and solar and fuel-cell generators. While these are useful sources of power for those who cannot be linked to the national grid, they remain localised options and are not feasible for large-scale generation. This, too, may change, says Lennon, as technology improves and larger, more efficient generators become economically viable.

#### **ANC, PAC Seek Independent Representation at UN Rio-92 Conference**

91WN0632A Johannesburg *THE WEEKLY MAIL*  
in English 4 Jul 91 p 1

[Article by Eddie Koch: "Mega-Summit at Sugarloaf"]

**[Text] South Africa's environmental problems will feature high on the agenda when the world's biggest-ever summit—on the environment—is held in Rio de Janeiro next year.**

Sugarloaf Mountain will form the backdrop to the world's biggest summit ever when top statesmen gather in Rio de Janeiro next year to hammer out a last-ditch strategy to halt the global slide into environmental crisis—and South Africa's problems are likely to feature high on the agenda.

The Earth Summit, due to take place in Rio between June 1 and June 12, is being billed as the biggest

international conference ever to be convened. The objective? To devise an "Earth Charter" that will regulate economic development and environmental behaviour around the world.

The conference was called for by the UN General Assembly and all heads of government from member states are expected to attend. "It is expected to be the largest summit meeting to date. International organisations, nongovernmental groups and private sector interests will also take part in an unprecedented attempt to mobilise people to set a new and more hopeful course for the future of humanity," says a statement from the United Nations Conference on Environment and Development (UNCED).

The main objectives are to agree on an Earth Charter that will provide internationally accepted guidelines for ensuring "sustainable development"—economic growth that ensures the survival of fast-vanishing natural resources—as well as an "Agenda 21" that will form a blueprint for action that all nations can follow into the 21st century.

A primary concern of the conference is to deal with problems specific to the Third World. The South African government has already been asked to prepare a national report on the state of this country's environment in anticipation of Pretoria being accepted back into UN circles by the time the summit is held.

Sydney Gerber, official for the Department of Environment Affairs, told *THE WEEKLY MAIL* this week that the government was hoping to send President F. W. de Klerk to Rio for the summit.

The Council for Scientific and Industrial Research (CSIR) in Pretoria has been asked to prepare a submission to the preparatory committee organising the massive summit and it appears this may be Pretoria's first opportunity to participate fully in the structures of the UN.

CSIR head Dr. Graham Noble told *THE WEEKLY MAIL* that a range of academics and government departments had been contacted to contribute to the report, which he hoped would be ready for submission next month.

The African National Congress [ANC] and the Pan Africanist Congress [PAC] have also been asked to contribute to the national report—but both organisations have shunned FRD's approaches and will seek independent representation at the summit.

"We will not participate in giving international credibility to the present regime which remains illegitimate and we will not back its efforts to get back into the UN," said Max Sisulu, head of the ANC's economics desk.

"Both the ANC and PAC have been participating fully in all the UN's structures, as recognised liberation movements, including the UN Environment Programme. We

have presented our position papers and will elaborate on these for submission to the Rio summit."

The official structure of the summit is that member states of the UN will be represented by their heads of government and nongovernment groups will participate in a separate conference that will be held in Rio at the same time.

It is likely that both the PAC and ANC will argue that South Africa presents a special case and that, given the likelihood that this country's white-dominated government will soon be displaced, the liberation movements should be given special status at the summit.

PAC environment representative Solly Skosana told THE WEEKLY MAIL his organisation had been contacted by FRD but would not take part in the government's report. "We will not give credibility to this government's efforts to gain readmission to the international community," he said.

Big business has also seized the chance to take part in the summit. First off the mark was Eskom, whose senior environmentalist John Hobbs attended the World Industry Conference on Environmental Management in Rotterdam in April this year.

"As a key industry and centre for environmental excellence, we were asked to help ensure that business participated in the preparations for the summit," said Hobbs.

Officials of the Congress of South African Trade Unions, Africa's biggest labour federation, visited unions in Brazil earlier this year and it is likely that they will attempt to ensure that the views of organised labour on strategies for sustainable development in Southern Africa will be tabled at the foot of Sugarloaf Mountain.

#### **Private Game Park Owners' Conservation Efforts Praised**

91WN0631A Cape Town *THE ARGUS* in English  
10 Jul 91 p 8

[Text] Pretoria—South Africa has become the world's leading trophy hunting country with an estimated 3,500 foreign hunters spending about R100-million here annually.

All trophy hunting in South Africa was on private land and was proof of the "abilities and enterprising spirit" of game-farm owners, said Dr. Piet Mulder, head of the Transvaal Directorate of Nature and Environmental Conservation.

He was addressing a group of private landowners and Transvaal Provincial Administration staff at the Sabi Sand Game Reserve.

"Thanks to the private landowners, the Lowveld is the only place in Africa where the so-called Big Five—elephant, buffalo, lion, leopard and rhinoceros—can be hunted," he said.

Early last year South Africa was presented with the International Wildlife Conservation Award of Safari Club International, the largest nature conservation and hunters' association in the world.

At the same function, Mr. Fanie Ferreira, MEC [expansion unknown], also praised the efforts of Lowveld landowners in attracting foreign revenue to the country via their game and nature conservation efforts.

He was, however, of the opinion that even more could be done to attract trophy hunters to South Africa.

Mr. Ferreira said that there were in the region of 2.5-million registered bow hunters in the United States of America. A South African trophy hunting safari could be marketed to them for the same price as a similar expedition in Alaska or Canada.

"Nonetheless, only a handful of bow hunters come to South Africa annually. It is clear that this highly profitable market has not yet been properly developed," he said.

In giving credit to the private sector for its efforts in nature conservation, Mr. Ferreira said that the combined area of the Transvaal's 1,450 exempted properties—game farms and private nature reserves—amounted to some three million hectares. The nature and environmental conservation directorate has some 200,000 hectares under its control.

"In the Lowveld between the Sabi and Olifants rivers, some 400 landowners have established more than 300,000 hectares as conservation areas. This outstanding achievement can be judged to value when one considers that it is, after the Kruger and Kalahari Gemsbok national parks, the third biggest conservation area in the country.

"As far as can be determined, nowhere in the world does private enterprise play such a vital role in the conservation of a country's natural resources as in the Transvaal, but especially in the Lowveld.

"Without your efforts, these vast tracts of land with the associated herds of wildlife, would not have existed as we know it today," he said.

#### **ZIMBABWE**

##### **Reluctant Enforcement of Environmental Laws Questioned**

91WN0691A Harare *THE HERALD* in English  
4 Jul 91 p 8

[Editorial: "Pollution Laws Must Be Enforced"]

[Text] Zimbabwe has some very strict laws to prevent menaces to public health and to keep pollution from its rapidly expanding industry within modern safety limits. We are told that we have adequate facilities to dispose of our toxic waste safely.

But the best laws in the world are useless if no one enforces them and the most modern disposal facilities are as useful as mosquito repellent in Antarctica if no one uses them.

The latest case of desultory enforcement to come to public notice was the spewing of asbestos dust, a known potential killer, in Harare's Kopje area. Tens of thousands of people work there and many more have to pass through this part of town on their way to and from work. Even if just one person was at risk, of course, action should have been taken, immediately.

It appears the problem is intermittent: for some weeks employees in the factory and people working nearby risked dying of ghastly lung diseases and for other weeks the dust was being filtered. For at least two years the municipality knew of the problem and wrote the odd letter and paid the odd visit. No one went to court, no factory was closed down.

Two weeks ago, a reporter from THE HERALD went to the area and took samples for the Government analyst. The results came pretty swiftly and confirmed the presence of asbestos in the dust falling around the factory. We published the story on Tuesday.

The same day workmen started cleaning up the mess and yesterday a new filtration plant was manoeuvred into position.

This is not the first time we have stumbled across a potentially serious health hazard caused by pollution and with little effective action from the authorities. A glance at our files reveals chemical waste being dumped in a Seke river, oil flowing down the Mukuvizi, cement dust settling in various parts of Harare and a badly-sited fertiliser plant destroying the ground water over a large area and threatening the Harare metropolitan water supply.

Even more worrying are statements that what the authorities hear about, even if they do not leap into action, is probably only the tip of the iceberg. Zimbabwe has a

good environment record. We wonder if this would still be true if every breach of regulations was put on that record.

Finding polluters seems fairly simple, especially if the toxic wastes cause other people discomfort. The asbestos case is a good example: people complained, the municipality investigated and found the complaints justified. A nosy reporter using commonsense and a cheap and readily available analysis service was able to pinpoint the problem in days.

It is far harder to understand why so little happened over two years and why the authorities were so reluctant to use the big stick given in our laws. If there is some loophole in our legislation that makes life difficult for enforcers, no one has ever mentioned it. And we are sure Parliament would be glad to plug any gaps brought to its attention.

Industrialists complain that they cannot get needed equipment. Perhaps this is so, but if it was made clear that pollution was totally unacceptable they would try harder and if there are insurmountable problems with importing equipment then currency allocators need to rethink their priorities.

Special incentives are now being offered to both local and foreign investors to turn Zimbabwe as rapidly as possible into an industrialised nation and create the wealth and employment we so desperately need. But these incentives must not include relaxation of pollution-control laws and the authorities must advise and help the small man entering industry earn a good living without harming himself and his neighbours.

Basically everyone must be committed to ensuring rapid development without poisoning those the development is supposed to benefit. The industrial revolutions in the North show the real dangers of industrialising without such a commitment. Stopping the problem in the first place is cheap; cleaning up the mess later is hundreds of times more expensive and the ruined lives can never be restored.

**Results of Quebec Energy Consumption Poll  
Reported**

*91WN0705A Montreal LA PRESSE in French  
18 Aug 91 p B5*

[Article by Rudy Cours]

[Text] To persuade Quebecers to conserve energy, one must speak to them more about money than pollution or about protecting the environment.

This is the main conclusion of reports on wide-ranging studies ordered by Hydro-Quebec concerning the energy habits of Quebec households and their attitudes toward energy efficiency, reports of which *LA PRESSE* has obtained copies.

To give an idea of just how serious they are, let us note that the research was conducted on the basis of 3,006 scheduled home interviews. The second was based on preliminary results of the first and consisted of telephone polls of 2,021 respondents.

Before examining results in detail, let us look at the "nuts and bolts" of the study. The research presents a remarkable picture of household electrical appliances, the average age of equipment, use made of it, and the type of lighting or heating chosen.

Let us take the example of laundry. We learn that 92 percent of the 2.5 million households in Quebec have a washing machine that is, on the average, nine years old. Quebecers do an average of 6.5 washings a week, regulate the water level in 92 percent of all cases, use cold water 65 percent of the time, and rinse with cold water 86 percent of the time.

One finds similar data for drying, dishwashing, heating, the refrigerator, kitchen stove, and so on.

When one looks at water heaters, the survey's revelations become absolutely horrifying. One learns that 90 percent of all water heaters installed are individual rather than central, electric, and have a capacity of 40 gallons in 59 percent of the cases and 60 gallons in 39 percent. They are seven years old, on the average. In 76 percent of all cases, they are in the basement and kept at an average temperature of 58.2 degrees Celsius in a room whose average temperature is 19 degrees. Only three percent have exterior insulation, while the conditions call for covering 82 percent.

As one can guess, such results enable Hydro-Quebec to adjust its series of energy efficiency programs so as to

achieve savings on the provincial level of some 12.9 terrawatt/hours [as published] starting in 1999, equivalent or nearly equivalent to the energy production of the future Grande-Baleine complex. Four of these programs were launched in the spring and two more will be unveiled in September.

In order not to repeat such mistakes as last year's showerhead campaign, Hydro-Quebec also sought to learn how Quebecers behave in terms of energy efficiency.

This is how one learns that money is the decisive factor. Some 80 percent of all Quebecers would practice more energy conservation if they were economically motivated and 68 percent would be more careful about their use of electricity if rates were raised substantially, from 10 to 15 percent.

This information will not be ignored by officials of the national company when they announce the extent of rate increases scheduled to go into effect on 1 May. In 1990, Hydro-Quebec estimated that six percent would be adequate for 1992.

North Americans first and foremost, 57.6 percent of those polled still think that comfort in their homes is more important than the money they can save by a more enlightened use of electricity.

To paint an even clearer picture, the study shows deep skepticism about any changes in behavior that might be brought about by energy efficiency measures.

**Men and Women**

The main divisions in the first study are taken up in the second, but concentrate on individual behavior rather than households. They are an attempt to ascertain whether a young blue-collar worker does his laundry and cooking in the same way that a retired woman would.

**Energy Efficiency Among Different Groups of Quebecers**

Men are: in terms of attitude, more concerned about preserving their comfort and more skeptical about energy efficiency; and, in terms of behavior, less inclined than women to adopt small but effective energy-saving measures.

Women are: in terms of attitude, more concerned about saving electricity; in terms of behavior, more inclined than men to make small adjustments; and, in terms of concerns, more concerned about limited electricity, pollution, and demands made by native peoples.

**Redirection of Environmental Protection Management Examined**

91WN0611A Beijing ZHONGGUO HUANJING BAO  
[CHINA ENVIRONMENTAL NEWS] in Chinese  
27 Jun 91 p 3

[Article by Qu Geping [2575 2706 1627]: "Redirecting Environmental Protection Management Is an Urgent Task"]

[Text]

**I. Make Reliance on Scientific and Technological Progress an Important Agenda**

In March 1991, the State Council formally submitted its report concerning an outline for a 10-year program for national economic and social development and the Eighth Five-Year Plan to the National People's Congress. China's environmental protection goals and tasks were stipulated in this outline. The State Environmental Protection Bureau is now meeting with the State Planning Commission to formulate an implementation program.

Achieving the objectives for environmental protection in the Eighth Five-Year Plan and 10-year plan will require several measures. However, reliance on S&T progress to establish control of environmental pollution and improve environment quality on a solid and relatively advanced technical foundation is one important measure. This is an important task that we face.

In the early 1980's, we clearly pointed out that preventing environmental pollution requires relying on policies, relying on management, and relying on technology. Based on current conditions and the ideology of seizing primary contradictions, "strengthening environmental management" is a central link in our work. Through our efforts during the Sixth Five-Year Plan and Seventh Five-Year Plan, while achieving the magnificent goal of doubling our GNP [gross national product], China's environmental protection activities also made substantial advances. It established a preliminary environmental protection policy, law, and supervision management system with Chinese characteristics and effectively controlled development of several environmental problems. However, we did not completely achieve our objectives in the Sixth Five-Year Plan and Seventh Five-Year Plan and several new contradictions and disparities have continued to appear.

These contradictions and disparities are manifested most prominently in technical backwardness, insufficient investments in the environment, poor results, and other problems even as environmental management has been strengthened. Administrative practice in many regions has shown that controlling environmental pollution with insufficient environmental investments and a backward technical foundation makes improving environmental quality extremely difficult. The situation in Shenyang City left us with a deep impression. Shenyang

has managed its environment well. To summarize its experiences, I led a small group to make an investigation in 1986. In the area of controlling environmental pollution, they formulated unified provisions, proposed clear requirements, and established the corresponding management system, which in conjunction with consistently training good quality staffs led to relatively effective environmental supervision and management work. However, for most of the industrial enterprises in the city, outdated technology, in particular the large number of extremely backward industrial and civilian boilers, consumed large amounts of coal, created considerable waste, and caused severe pollution. This situation told us that simply relying on stronger management is not enough. We must make promoting S&T progress an important order of the day in environmental protection work. According to the concepts of systems theory, fostering the functions of a system is restricted by its weakest link. The weakest link in environmental protection work is now changing. It is now shifting from the "environmental management" link to the "environmental investments" and "environmental S&T" links. These weak links place extremely great restrictions on improving the overall results of environmental protection work. This is a fact we face that cannot be evaded.

Some time ago, we explored the question of investments in environmental protection and the preliminary conclusion we drew was that to achieve the objectives of our environmental program for the year 2000, we must increase environmental investments. The way to do this is to use perfected laws and regulations and higher standards to compel "polluters" to increase their investments in environmental protection and to view increasing investment results as an urgent task. Now, we must conscientiously study the question of environmental protection S&T.

Based on the macroeconomic situation and real requirements in environmental protection work, I feel that while we should continue reinforcing environmental management, we must also stress reliance on S&T progress. Everyone knows that S&T progress has a decisive impact on development levels and speeds of the forces of production. The development of the forces of production and comprehensive improvements in national strengths in all countries of the world cannot be detached from S&T progress. A great deal of research shows that S&T progress is not only a major source of economic development but is also the nucleus and key to economic development. In today's world, where economic development is increasingly subjected to various types of resource restrictions, failing to rely on S&T progress is unthinkable. This is true for an entire national economy and it is true for environmental protection. Detachment from S&T progress not only makes it hard to achieve the objective of improving environmental quality, but it also makes it very difficult to control the development of environmental pollution. Experiences in the developed nations show that using advanced prevention technology as the foundation and

implementing strict legal supervision are essential for achieving the objectives of controlling pollution and improving the environment. For example, the governments of the United States, Japan, and western European nations have employed various types of laws and regulations, policies, and standards to spur rapid development of environmental protection S&T, and they have effectively controlled pollutant discharges, improved environmental quality, and continually made new discoveries in many fields to form an emerging "green industry" that is providing a reliable technical foundation for environmental protection.

For China as a whole, insufficient motive force for technical progress is a common problem. From the perspective of environmental protection, the problem is even more acute. The causes for this lie in the economic system, the S&T system, inputs, plans, extension of S&T achievements, and other areas, but for environmental management departments themselves, ineffective S&T management work is another important reason. The pollution control technologies we are now promoting are too backward, not only in terms of levels in the developed nations but even backward compared to industrial technology levels in China. True, there are causes related to state economic policies and technology policies, but ineffective guidance and supervision by environmental management departments is another important reason.

## II. We Must Redirect S&T Management Work

China's environmental S&T work began in 1973. Since that time, the state has arranged for several S&T expenditures each year. In 1978, environmental scientific research became an important part of natural science research and was included in the state's long-term S&T plans. In 1983, the state included environmental protection S&T work among plans for attacking key S&T problems during the Sixth Five-Year Plan and it was further reinforced in the Seventh Five-Year Plan. Since the Sixth Five-Year Plan, the portion of state expenditures on projects to attack key S&T problems and three professional funds invested in environmental protection scientific research have added up to more than 130 million yuan. If we take into consideration capital inputs by all departments, regions, and enterprises, expenditures on environmental protection scientific research would be even higher.

After over a decade of construction, an environmental scientific research system on an initial scale with matching disciplines has taken shape on a national scale. To date, we have established over 200 environmental protection scientific research organs which have over 17,000 environmental protection S&T personnel. Moreover, environmental monitoring stations at all levels and all categories of environmental protection industrial enterprises have several 10,000 mid-level and advanced environmental protection S&T personnel.

For more than 10 years, there have been major openings in the field of environmental protection S&T research.

In the beginning, it started with pollution source surveys and gradually moved into various types of basic research and research on pollution prevention technology. For more than a decade, environmental protection scientific research work has expanded from industrial "three wastes" [waste water, waste gas, and industrial residues] to comprehensive control technology, from pollution source control technology to regional comprehensive control technology, and from pollution prevention technology to natural and agricultural ecological engineering technology. In the area of basic research, we have moved into research on environmental background values, environmental capacity, environmental quality assessment, and other areas and established several new methods and new concepts. In the area of management research, we have focused on developing work in areas like forecasting, planning, standards, management systems, and so on.

Through efforts over more than 10 years, and especially efforts during the Sixth Five-Year Plan and Seventh Five-Year Plan, we have made several achievements and our accomplishments should be acknowledged.

First, we have used basic survey research to gain a basic and clear understanding of environmental conditions in China and we have a relatively comprehensive and in-depth understanding of China's environmental problems.

Second, there have been major developments in pollution control technology and we have used imports and development to form several appropriate technologies. Now, several S&T achievements are created each year and over 4,000 projects have submitted applications for awards to the State Environmental Protection Bureau Information Institute's achievement database.

Third, we have developed our own ecological engineering technology and developed several single items and comprehensive technologies which have significant economic, social, and environmental benefits.

Fourth, we have made several valuable achievements in environmental forecasting, planning, management systems, standards, and other research fields that are providing an important scientific foundation for management work.

However, in an overall sense, environmental protection S&T are backward, guidance work is ineffective, and S&T have never been able to play an important supporting role in environmental protection work. As for S&T management work, it has fallen into daily organizational and administrative affairs and people are too busy to be doing the macro planning, guidance, supervision, and coordination work that should be their primary tasks. It is common in many regions for those who control pollution to be unable to find appropriate technology, which has greatly reduced the effectiveness of pollution control work. During the mid-1980's, the State Environmental Protection Bureau organized a survey of

industrial waste water treatment facilities. A basic conclusion drawn as a result of the survey was that of the various problems that caused the abandonment and shutdown of facilities and low efficiency, technical problems were the leading problem. Medium-sized and small treatment facilities in all industries had serious design and technical problems. These problems are also quite common in the environmental protection field.

The main reasons for this situation are:

First, investments are inadequate, making it difficult to do research and development targeted on developing appropriate technology. For environmental protection departments, each year they only have a very small amount of "three projects" funds and some funds to attack key S&T problems, which is utterly inadequate to solve China's environmental problems. It can be said that these investments are not sufficient even to conduct a rather large demonstration project for preventing industrial pollution, and there is a question of the schedules involved in scientific research. Generally speaking, the scientific research achievements made during the Eighth Five-Year Plan will not play a role until the Ninth Five-Year Plan or even later, which is far from capable of meeting present needs.

Second, the structure of scientific research is irrational and no stable ladder-shaped structure of basic research, applied research, and extension and utilization has been put together. Experiences in foreign countries indicate that a rational structure must be maintained for basic research, applied research, and extension and utilization for S&T and there must be even larger matching capital and S&T forces in the areas of applied research and extension and utilization. We, however, lack adequate capital guarantees in precisely these two areas and we do not have sufficient S&T forces.

Third, there are major defects in the environmental protection S&T management system and environmental protection S&T management departments are unable to play an effective role in planning, guidance, supervision, and coordination. Environmental protection S&T forces are rather scattered at present and although there is a preliminary division of labor, actually everyone just does what they want, which has led to low-level repetition in research work and a shortage of research in many fields, while these fields also compete against each other, leading to substantial waste of scientific research expenditures without achieving the corresponding benefits.

Fourth, organization and management of environmental protection S&T achievement extension is ineffective. People often say "science and technology are the first forces of production". To convert them into forces of production, S&T achievements must be applied in practice in the national economy. For a long time, we have not been concerned enough about the extension of S&T achievements and we have neglected comprehensive analysis, assessment, comparison, and optimized selection concerning technology development and technology

importing. We have been unable to form a system of matching applied technology measures and enterprise and design technology regulations, so many technical achievements have not been effectively promoted and applied.

Fifth, there has been no unified planning and management of work to import various types of prevention technology and there has been a shortage of selective evaluation and assimilation, which has reduced the results of technology imports.

Based on state deployments, the focus of all economic work during the Eighth Five-Year Plan and Ninth Five-Year Plan should still be on improving structures, reducing consumption, and increasing results. This will require us to make substantial advances in the areas of improving the results of environmental management, especially the returns to environmental investments. At the same time, there will still be substantial development of basic industry in China over the next decade, which will create even greater pressures for environmental protection work. In summary, the objective situation requires a new breakthrough in environmental protection S&T work to be able to provide effective technical support for China's environmental protection work.

All conditions show that environmental S&T management work cannot continue doing things this way. There must be changes. It must move out of the narrow circle at present of focusing mainly on administering limited scientific research projects and orient toward the entire nation and toward all industries and areas, and shift the center of its work to S&T planning, guidance, supervision, and coordination work. Planning means organizing the formulation of medium and long-term environmental protection S&T programs. Guidance means providing direction and extension services for environmental protection S&T achievements. Supervision means supervising and inspecting the implementation of environmental protection technology in accordance with the law. Coordination means readjusting and matching up environmental protection S&T work among industries and among regions. For real needs in environmental protection work during the Eighth Five-Year Plan and Ninth Five-Year Plan, it is even more urgent that we shift the focus of S&T organizational and administrative work toward selection, evaluation, extension, and application of existing technical achievements in all industries and try as much as possible to select several technically mature optimum appropriate technologies that produce good results and represent the direction of technical development from the technology that has been developed and imported in all industries and regions and actively extend and utilize it. At the same time, we should abandon several outdated, backward, and major polluting production techniques and technologies, products, and equipment. If we can make this transition, I believe there is much that can be done in environmental protection S&T management work.

### III. The Time Is Ripe To Redirect S&T Management Work

There are many conditions favorable to redirecting S&T management work and doing good selection, evaluation, extension, and application work for S&T achievements.

1. There is guidance by technology policies. In 1986, the State Council issued environmental protection technology policy points, the State Environmental Protection Bureau formulated special technology policies for preventing atmospheric and water pollution, the metallurgical, chemical, machinery, petroleum, light industry, and other departments formulated environmental protection technology policies for their own industries, and several provinces and municipalities began working on formulating local environmental protection technology policies. Provisions were made in the environmental protection technology policies concerning technologies to adopt, develop, restrict, and abandon, which gave clear direction to selection, evaluation, and extension work.

In November 1990, the State Council's Environmental Commission issued its "Opinions on Actively Developing the Environmental Protection Industry" and proposed a development list regarding environmental protection monitoring instruments, pollution prevention technology, comprehensive utilization technology, environmental engineering and ecological engineering, and materials. This provided an important foundation and guidance objectives for selection, evaluation, and extension work.

2. There are definite technology reserves. For the past 10 years, and especially via development and importing during the Seventh Five-Year Plan, we have now obtained several rather good applied technologies. Recently, the Science and Technology Department in the State Environmental Protection Bureau did a survey of environmental protection technology and extension conditions in nine departments. The results showed that there were many appropriate smoke and air cleaning, dust removal, waste water treatment, and comprehensive utilization technologies in the papermaking, electric power, chemical, construction materials, iron and steel, non-ferrous metals, machine-building and electronics, light industry, and other industries, that several of them had been extended and applied to varying degrees in each of these industries, and that they had produced satisfactory environmental benefits and economic benefits. The characteristics of these technologies were: 1) They involved advanced technology, mature techniques, and represented the direction of technical development; 2) There were important for extension throughout certain industries and, if promoted and developed, could substantially reduce pollution loads; 3) They can increase resource utilization rates, reduce production costs, and provide rather good economic benefits. An example is the countercurrent flotation washing and evaporation condensation technology in the electroplating industry which can produce water savings of 90

percent and recover about 20 percent of chemical industry raw materials. It is appropriate for use in all types of electroplating plants and is a prevention measure that has now been recognized to be economically effective and has now been adopted in several hundred plants. Papermaking white water recovery technology can reduce papermaking waste water discharges and the suspended matter content of waste water. It can conserve 200 tons of water and recover 100 kg of fiber per ton of paper produced, totalling about 60 yuan renminbi, and it is now being used in 50 percent of papermaking enterprises in the light industry system. The "TS series cooling water treatment agent and dual closed water loop circulation system" included in the State Science and Technology Commission's S&T achievement extension plans for 1990 conserves 90 percent of the water in synthetic ammonia production. Over 200 small synthetic ammonia plants have now adopted this technology, with yearly water savings of more than million tons. If the black liquid soda recovery technology for pulp making in the papermaking industry was extended to all large and medium-sized papermaking plants, 350,000 tons of soda could be recovered each year with economic benefits of 350 million yuan, and it could reduce discharges of organic matter (calculated in  $BOD_5$ ) by 480,000 tons. There are now 110 soda method and sulfate method pulp making plants with daily output greater than 50 tons which have adopted this technology.

3. There is a definite foundation in technology extension work. A survey indicates that the environmental protection technology policy points issued by the state have been implemented to varying degrees in all areas and all departments in China. Many regions and departments have begun organizing environmental protection technology selection and evaluation work. During the past two years, the State Environmental Protection Bureau's Science and Technology Department has organized and compiled a summary report on environmental science research. The Ministry of Chemical Industry has selected several advanced technologies over the past five years for extension in the chemical fertilizer, chlorine and soda, calcium carbide, carbon black, farm chemical, dye, paint, organic chemical, and other industries and it selected and evaluated over 100 achievements for extension and utilization during 1988 alone.

S&T demonstrations are an important link in extending and applying S&T achievements. During the Seventh Five-Year Plan, the state established several demonstration projects for atmospheric and water pollution prevention technology, and other fields. In coal-shaping technology, for example, a set of technologies and equipment have been developed and we have established six industrial coal-shaping demonstration plants. In urban sewage oxidation pond treatment technology, different regions and different climatic zones have established several demonstration projects that are providing a reliable foundation for the state's promotion of this technology.

In 1988, the State Science and Technology Commission began organizing implementation of the "State Key S&T Achievement Extension Plan". In 1990, following recommendation by the State Environmental Protection Department and relevant departments and local areas, 33 environmental protection S&T projects were included in this plan, all of them relatively mature and appropriate technologies.

4. An initial environmental protection technology market has already been formed. As reform of the environmental protection technology system has gradually become more extensive and constant improvements have been made in all environmental management systems, there has been substantial development of China's environmental protection technology market.

The volume of environmental protection technology contract trade has grown every year for the past several years, environmental protection technology market activities are flourishing, and there are growing numbers of environmental protection technology business projects. Environmental protection technology markets, mainly involving technology exhibitions, trade fairs, project bidding, and so on have begun to flourish. In October 1988, the Ministry of Chemical Industry held a "National Chemical Industry Environmental Protection Comprehensive Utilization Technology Exhibition" and exhibited 446 technologies and nearly 100 types of instruments and equipment. Transfer agreements were reached with 164 units regarding 34 technologies for a technology transfer volume of more than 8.6 million yuan. At the 1990 "National Urban Pollution Prevention and Energy Conservation New Technology and New Products Exchange and Trade Ordering Fair", supply and sales contracts worth over 9 million yuan were signed during the exhibition for the "benzene-free diluent" developed by the National Defense Science and Engineering Commission's Yuansu Chemical Industry Plant. The Ministry of Machine-Building and Electronics Industry held the "1st Beijing International Environmental Protection and Resource Comprehensive Utilization Equipment Exhibition" and "Shanghai National Environmental Protection Machinery and Resource Comprehensive Utilization Fair". The entire army held an "Army-Wide Water Conservation, Electricity Conservation, and Coal Conservation Applied Achievements Exhibition".

Environmental protection attitude control achievements have begun entering international markets. At the relevant international fairs, China's environmental protection technology and products received good evaluations and won users. Environmental protection products from 10 plants in Shanghai have now entered southeast Asian markets and all parts of Europe and the United States. Dyeing waste water treatment equipment from Sichuan's Xindu Environmental Engineering Special Equipment Plant is now being sold in batch quantities in southeast Asia.

5. There have been continual increases in environmental protection investments. Since the 1980's, because environmental protection has been included in state, local, and various industry development plans, there have been continual increases in environmental protection investments, growing from less than 2 billion yuan in the early 1980's to 10.2 billion yuan in 1989. In the 1990's, as our national economy grows stronger and environmental laws, regulations, systems, and plans are implemented, there will continue to be increased investments, which will provide a material foundation for adopting all types of advanced pollution prevention technology.

6. There is a relatively complete environmental management system. After more than a decade of efforts, we have formulated relatively complete environmental protection law, regulation, and standards systems and established eight environmental management systems which have provided a definite legal basis and practical foundation for redirecting the focus on S&T management work.

7. A rather good economic and social environment has been provided for the state's economic development principle of "selection, evaluation, and promotion". During the Eighth Five-Year Plan and the entire decade of the 1990's, a main task in China's economic development is to shift economic development from "speed" to "results" and from "material input guidance" to "S&T input guidance". 1990 is "quality, product variety, and results" year. This also creates new demands and provides a vast arena for promoting new non-polluting, energy conserving, and water conserving technology, techniques, and equipment to increase resource and energy resource utilization rates.

#### IV. How To Do Good Selection, Evaluation, and Extension Work

In the area of S&T achievement selection, evaluation, and extension, although we do have a substantial foundation, much work has not been done and the foundation is weak. This is manifested in:

1. A lack of unified and coordinated management. There is separation now of regions and industries and a lack of contact, failure to transmit information, and very little integration and cooperation, which has led to a lack of clarity regarding the levels, distribution, and potential of existing technical achievements. Although many areas and industries have developed some selection, evaluation, and promotion activities, they have played a very limited role because of the lack of unified coordination, planning, and management.

2. In work arrangements, there is simplicity of selection, evaluation, and promotion work. Over the past few years, although we have focused on gaining a grasp of environmental protection S&T achievement review, analysis, and summarization and compiled highly readable and widely disseminated lists of books that have been selected and assessed by experts as being truly feasible technical achievements and recommended them

to society to guide technical requirements for adoption by departments, we have neglected selection, assessment, and promotion of applied administrative, policy, market, and other multilevel and omnidirectional achievements. As a result, the benefits are limited.

3. In the structure of selection, evaluation, and extension of achievements, the proportion of pollution control technology achievements has been too low.

In summary, technical achievement selection, assessment, and promotion work has received insufficient attention and has a weak foundation, and we have still not established an operational mechanism for coordination of management.

“Selection and evaluation” are fundamental to extending S&T achievements. Without selection and evaluation, extension is impossible. Controlling pollution under different circumstances requires the use of different categories and different levels of technology. “Selection and evaluation” are actually a process of technology selection, meaning the selection of the optimum technology required according to specific standards. “Selection” means making choices from a wide range of technology on the basis of preliminary assessments. “Evaluation” refers to comprehensive assessment of the advanced qualities, appropriateness, and benefits of a technology.

Selection and evaluation of environmental protection technology achievements is generally carried out in four steps. The first step involves setting goals and dealing with pollution situations and environmental objectives by setting goals for technology choices. The second step is to survey conditions, including pollution and control conditions, various parameters and input/output conditions for production techniques and technology, environmental benefits, social benefits, and so on. The third step is assessment and analysis for comprehensive comparison of the advanced qualities, appropriateness, and feasibility of each type of control technology to suggest selection programs. The fourth step is to select optimum technologies, give full consideration to the advantages and disadvantages of each type of technology, and select technology that is technically feasible and economically rational and which has good environmental benefits.

The key to “selection and evaluation” work is setting standards. Some technologies from scientific research achievements are useable but economically unfeasible. Some technologies are economically rational but have poor environmental benefits. Thus, we must establish a series of selection and evaluation indices and standards that integrate technical, environmental, and economic properties to have a unified standard that can be used for quantitative and qualitative comparison and analysis and gain greater confidence in the technology chosen. When setting standards, we must resolutely unify environmental benefits and economic benefits and resolutely

unify advanced qualities and appropriateness to achieve our environmental protection objectives to the greatest possible extent.

The organizational form of selection and evaluation can use two tracks: selection and evaluation by environmental protection departments or administrative departments, or selection and evaluation by users.

The purpose of selection and evaluation is extension and utilization, so while doing good selection and evaluation, there also should be active use of various measures for extension.

Given China's social conditions, the basic route to promoting and applying S&T achievements is integration of planned extension and market diffusion. There are three main patterns:

First, there is command-type extension. This refers to the use of administrative means by the government in accordance with administrative or plan commands to compel the implementation of mature techniques and technologies with significant environmental benefits and economic benefits.

Employing a command-type extension arrangement is a special requirement in the environmental protection industry as well as legal grounds. Protecting the environment and preventing environmental pollution and ecological destruction are compulsory. The “Environmental Protection Law” clearly stipulates that “newly-constructed industrial enterprises and technical upgrading in existing enterprises should adopt equipment and technology with high resource utilization rates and small pollutant discharges and should adopt economically rational comprehensive waste utilization and pollution treatment technology”. Environmental protection administrative departments at all levels of government, which implement unified supervision of environmental protection throughout China, are required to and have the authority to stipulate several pollution control and ecological destruction restoration technologies that must be implemented.

While promoting advanced technology, we also should restrict and discard techniques and technologies which are backward and cause serious environmental pollution. Many industrial departments have begun adopting a variety of measures in the area of restricting and abandoning seriously polluting techniques and technologies. Based on environmental protection technology and economic policies during the Seventh Five-Year Plan, the Ministry of Chemical Industry compelled the abandonment of mercury method soda production technology and nine of China's 10 mercury method caustic soda plants have now completed technical upgrading to use the ion membrane or diaphragm method to replace the mercury method and completely eliminated mercury pollution sources. The Ministry of Machine-Building and Electronics Industry has also obtained very good results in abandoning backward boilers.

Command-type promotion can be dispatched by a single department or by several departments to issue administrative orders and arrange for compulsory implementation of plans. Information indicates that all areas of society support this method and we should focus on its implementation.

Second, there is guidance-type extension. This refers to the government formulating environmental protection technology policies, issuing environmental protection S&T achievement reports or S&T achievement lists, compiling and implementing S&T achievement extension plans, establishing demonstration projects and items, and formulating matching preferential economic policies to spur and guide all industries and all regions to implement several relatively mature techniques and technologies with rather good environmental benefits and economic benefits.

Guidance-type extension is a technology promotion arrangement that has been widely adopted by all departments and all regions at the present time. To provide macro guidance of the direction of extension and application, the first thing is to formulate the corresponding environmental protection technology policies. At present, in addition to the environmental protection technology policies issued by the State Council, the State Environmental Protection Bureau and metallurgical, chemical, and other industrial sectors as well as several provinces have formulated comprehensive and special environmental protection technology policies.

The main part of guidance-type extension is compiling and implementing S&T achievement extension plans. Publishing lists, establishing demonstration projects, and formulating preferential policies all serve the compilation and implementation of extension plans and are an essential part of the plans. Now, the State Science and Technology Commission and local science and technology commissions are organizing the compilation of national S&T achievement extension plans divided into two stages, the "State S&T Achievement Key Extension Plan" and "Local S&T Achievement Key Extension Plan". Environmental protection departments at all levels should coordinate with the science and technology commissions and actively do good recommendation work for environmental protection S&T achievement extension plan projects. At the same time, environmental protection departments at all levels should try to expedite all departments and all industries in formulating and organizing the implementation of environmental protection S&T extension plans for their own departments and own industries, and directly formulate and implement specific S&T achievement extension plans based on administrative requirements. For fees collected for discharging pollution, directional arrangements can be made based on the requirements of each extension plan.

Third, there is market diffusion. Command-type extension and guidance-type extension are two arrangements for extension in state plans. Corresponding to them is

market diffusion. Market diffusion means using all sorts of market trade arrangements including the provision of technical consulting services, compensated transfers of S&T achievements, technology product sales, holding S&T achievement exhibitions, fairs, and trade talks, organizing bid solicitation for topics, and using environmental engineering companies, industry groups, and other arrangements to integrate technology, engineering, trade, production, supply, and sales to disseminate environmental protection S&T achievements.

As reform of the economic system and S&T system intensifies, there have been major developments in the conversion of China's S&T achievements into commodities and a technology market system has gradually developed. Now, all regions have established several permanent technology trade markets, most of them intermediary organs like technical service centers and exchange centers. A large number of scientific research academies are participating in market trade and have created several specialized technology companies including some environmental protection technology companies, and they have begun forming technology market information networks. As for the structure of the technology market system, environmental protection technology markets have already become a part that cannot be ignored. In the development and growth of markets, all types of trade patterns have also developed and are providing a variety of market channels for disseminating environmental protection technology.

Opening up environmental protection technology markets and making them prosper helps orient environmental protection S&T work toward environmental management and effective control of pollution, enables the parties who supply and need products to meet directly, shortens the schedule for converting scientific research achievements into production applications, prevents the detachment of scientific research from production, helps destroy the situation of separation and isolation and reinforces horizontal relationships, helps motivate the initiative of S&T personnel, and speeds up the extension of environmental protection S&T.

These three patterns should coexist in China's planned commodity economy, but each has its own advantages and disadvantages and its own scope of applications. Command-style extension is simple and quick, always consistent, and relies on administrative "pressure". Guidance-style extension covers a broad area and has definite flexibility and freedom, and relies on "promotion". Market diffusion allows users to select appropriate technology according to their needs and "compare multiple suppliers", which helps in the operation of competitive mechanisms and promotes environmental protection technical progress, and it relies on "attraction".

These three patterns are not mutually independent but are instead mutually interrelated, mutually permeated, and constitute a single entity. On the one hand, command-type and guidance-type extension must be based on environmental protection technology markets,

respect the principles of technology commodity trade, and conform to the laws and provisions of technology markets. On the other hand, market diffusion requires guidance by plans and is subject to restriction by command-type and guidance-type policies. It can be said that none of these three patterns can be omitted if we want to achieve good S&T achievement extension and application. Thus, we must properly coordinate the relationships among the three.

Based on the levels and circumstances of China's environmental protection S&T achievement extension work, I believe that extension work should be divided into three steps:

Step 1: focus on command-type extension with guidance-type extension as a supplement, and be concerned with opening up environmental protection technology markets. The reason is that market mechanisms in China's environmental protection S&T achievement extension are incomplete, channels are still quite impeded, and there is seriously inadequate motive force for progress. Selecting the command-type extension arrangement could solve several major pollution problems, establish demonstrations which integrate environmental benefits and economic benefits, and make polluting units gain an understanding of reliance on advanced technology to control pollution. Thus, it is very important.

When compelling extension, we should give preference to selecting technology that is technically reliable, broad in coverage, produces results quickly, and has vitality. In the beginning, this scope should be somewhat small and we should work on the easy first and the difficult later and on the simple first and the complicated later.

In this stage, we also should focus on work to abandon several types of backward technology. The focus is on issuing integrated commands to the energy, light industry, metallurgical, chemical, and other industrial departments. At the same time, this should be coordinated with selection and evaluation work and we should work on formulating the corresponding policies.

Step 2: on the basis of continuing to maintain a small amount of command-type extension, shift the focus of work to guidance-type extension, rely on technology policies, formulate and implement various types of extension plans, coordinate and control the extension and application of environmental protection S&T achievements, and develop and perfect environmental protection technology markets.

Using technology policy to guide the utilization of environmental protection technology achievements to control pollution is an important arrangement for environmental protection technology achievement extension work. Neither command-type extension or market diffusion can be detached from guidance by environmental protection technology policies, and this arrangement has an important status in the extension of environmental protection technology achievements. In this stage, we should formulate a series of environmental protection

technology policies and matching measures for macro coordination and control of environmental protection S&T extension.

Step 3: after technology markets are relatively complete, focus our work on strengthening coordination and administration, form standard, system, and network new operational mechanisms with self-development capabilities, make environmental protection technology markets prosper, and use market mechanisms to extend environmental protection S&T achievements.

There are many problems in China's environmental protection technology markets at present. Technical service organs and technical intermediary organs are imperfect, management forces are weak, no environmental protection product quality assurance system has been established, many immature technologies, unacceptable products, and nonstandard equipment have been mixed into the market, and no normal competitive mechanisms have been formed, which has negative effects on extending and applying advanced technology and affects healthy development of environmental protection technology markets. Thus, we should provide more guidance through policies, laws, and regulations and strive to form market mechanisms as quickly as possible.

My preliminary idea is to use three stages to establish an extension system in which the three arrangements are mutually integrated and mutually complementary, and to gradually form a new situation of reliance on S&T progress for environmental protection.

The environmental protection industry is the material and technical foundation for solving environmental protection problems, it is an important link in applying S&T achievements to control pollution, and it is a major guarantee that environmental protection S&T achievement extension work can proceed smoothly. An environmental protection industry that includes equipment, instruments, materials, afforestation, and ecological engineering, as well as research, design, construction, consulting, and evaluation is now emerging throughout China, and guiding organic integration of this emerging industry with environmental protection S&T achievement extension is extremely important.

In summary, both favorable aspects and definite problems exist in completing a redirection of S&T management work toward "selection, evaluation, and extension" of S&T achievements. Thus, we should advocate being bold in opening up and advocate doing intensive and careful work. For this reason:

1. Environmental protection management departments should move quickly to meet with all industries and departments to organize experts in scientific research, administration, production, and other areas to compile environmental protection optimum technology application recommendation guides and establish evaluation and verification commissions to select and evaluate several optimum applied technologies and optimum

feasible technologies to provide services and solve technical problems and confirm them as special industrial control technologies for the current stage. At the same time, they should establish and perfect technical service centers and establish intermediary organs.

2. The extension and application of achievements requires capital support, and money must be spent for selection and evaluation work, so I propose that we establish an environmental protection S&T achievement extension fund and try to increase capital inputs in S&T demonstration projects.

3. Extension and application require the support of corresponding technology policies and preferential policies, and they require the formulation of various management methods and provisions. For example, we can stipulate that enterprise and business units that apply to use pollution discharge fees must apply the specified technologies, and so on.

#### **V. Adapt to the Redirection of S&T Management Work, Intensify Environmental Management Work**

Redirection of environmental protection S&T management work will place new and higher demands on all aspects of environmental management work. The redirection of environmental protection S&T management work is an intensification of environmental management work. This sort of change will inevitably engender changes in all links in environmental management. Many years of practice in environmental protection have gradually allowed us to gain a clear understanding that supervision and administration are the primary duties of environmental protection departments. This is an important development in the ideology of environmental management. However, environmental supervision and administration is not simply building castles in the air. It must be established on an advanced and reliable environmental protection technology foundation in all industries. Given this point, we have still not done enough work, and in particular our technical guidance and service work has been insufficient. Environmental management personnel at all levels are frequently perplexed: they demand that enterprises control, but they can suggest no reliable technology to use. This creates two outcomes. One, it restricts the effective implementation scope of environmental management and there is much administrative work that is not implemented in concrete prevention activities. Two, it prevents environmental protection investments from attaining the expected objectives, which affects the returns to investments. Basically speaking, this has weakened the intermediate link in the chain of environmental management—pollution prevention activities—environmental quality, which means that although we expend a great deal of effort on environmental management, in the end we are not able to control pollution and improve the environmental quality very effectively. After the redirection of S&T management work and after establishing complete selection, evaluation, and extension mechanisms so that environmental supervision and

management have a legal footing, we can further intensify and expand “technical supervision and management”, meaning that besides controlling environmental objectives and controlling pollution discharges, we also can control production processes and the corresponding prevention technology. Only then will this type of control be actively effective. This does not mean a return to a direct focus on pollution control. It is exactly as was stated previously, the main thing in technology supervision and management is to have a legal footing and use the functional roles of planning, guidance, supervision, and coordination to prevent pollution and improve environmental quality. When established on a reliable technical foundation, we will be able to achieve our expected environmental management objectives on schedule.

Redirection of S&T management work has provided a reliable technical foundation for formulating policies, laws, plans, and standards and for implementing all types of management systems. This also places new demands on all types of environmental management work. Anything that does not adapt to this change must be readjusted to enable selection, evaluation, and extension to be infused into all aspects of management work.

When formulating programs and plans, having this type of technical support can provide all departments and all industries with an idea of what kind of environmental standards and goals they should have, how much capital they should invest to extend these technologies, and what kind of auxiliary technical and economic measures are required. The programs and plans formulated in this way will be clearer and more feasible. At the same time, to enable all environmental programs and plans to obtain this sort of technical support, when planning departments are formulating plans and programs, they also should make selection, evaluation, and extension of optimum applied technology a central link and clarify the scope of environmental protection technology development directions and application ranges. This would closely integrate planning work and S&T work.

This is also the case when formulating standards. After gaining an understanding of actual techniques and technologies in each department and each industry and making detailed economic and technical assessments, truly realistic environmental standards can be formulated. After surveying, evaluating, and forecasting advanced applied production technology and advanced applied pollution control technology, the short-term enforcement standards and leading environmental standards required for implementation of construction project management and medium and long-term plans can be formulated. Moreover, during the process of S&T achievement selection, evaluation, and extension, all types of environmental standards, especially standards which concern the quality of techniques, technology, and equipment are an important foundation and indispensable measure. This situation shows that formulation of environmental standards must be closely integrated with S&T achievement selection, evaluation, and extension.

This is also the case when implementing the new and old eight-item systems. When assessing the environmental impact of newly-constructed industrial projects, clear technical requirements can be obtained regarding what types of prevention measures should be adopted. When inspecting and accepting "three togethers" projects, there is a basis and standards. When implementing time-restricted control and pollution discharge permits and centralizing control systems and measures, if sets of this sort of applied technologies are available, they will be handy for environmental management personnel at all levels and their work will be implemented well. Moreover, including definite indices and requirements for selection, evaluation, and extension work as appropriate in all systems will substantially spur this work.

In summary, after establishing a "selection, evaluation, and extension" system, if S&T work can truly play the supporting role we hope for, there will be a major takeoff in all aspects of environmental management work. Then, we will be able to effectively achieve the objective of controlling pollution, and this will push China's environmental protection activities continually forward!

### Contradictory Enforcement Policies Increase Pollution Woes

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[Text] Despite strict legislation, China's pollution woes are becoming more serious.

Since 1979 Beijing has enacted more than 30 laws and regulations, and implemented rules on environmental protection. But these measures have yet to have much positive effect on the country's environment.

What worries investors most is the fact that state-owned enterprises seem to ignore pollution regulations and get away with it.

China's environmental standards are high compared with some developing countries, although they fall below those of the United States or Europe. Awareness of China's growing pollution problems seemed to heighten when the National People's Congress (NPC) promulgated the Environmental Protection Law (EPL) in 1989—10 years after a trial law was approved.

In addition to the EPL, the National Environmental Protection Agency (NEPA) was established in the late 1980's under the State Environmental Protection head Li Ping, China appeared to be gearing up for a serious battle against pollution.

The war has yet to be waged, however, and Mr. Li's interest in environmental issues appears to have waned. The evidence is his support for such projects as the Three Gorges dam that will flood valleys and silt waterways; and the Daya Bay twin nuclear reactors in Guangdong province.

The NEPA, while the supreme authority on environmental protection, does not have ministerial status. Officials do not widely understand the EPL and are sometimes not even aware it exists. In the end, the country has consistently traded environmental protection for economic development.

The latitude that Beijing gives to state-run enterprises in meeting environmental protection requirements is not extended to foreign-invested ventures. The reason, plain and simple, is money, Beijing believes foreign firms are in a better financial position to put pollution control systems in place.

The contradictions in China's attitudes toward pollution control abound. In one case, Chinese authorities required Glaxo-China, the Chongqing joint venture of the British pharmaceutical company, to submit testing results on both air effluents and waste water deposits—even though the company does not use water in its production.

When a local factory's emissions blew into the venture's air conditioning unit, contaminating the entire facility, local authorities and the NEPA refused to intercede on the company's behalf.

China's "pay to pollute" policy is also part of the problem. It gives factories little incentive to implement pollution control technology because companies have the option of paying a nominal fine based on the concentration of effluents released when caught polluting.

The fine is set well below the marginal cost of installing environmental protection equipment.

While the "pay to pollute" policy also applies to joint ventures and wholly owned ventures, Beijing expects them to cover the entire cost of installing equipment—and then can still threaten them with closure.

These dark clouds do have a silver lining—for vendors of pollution control equipment. As more foreign firms move into China and the country's economy begins to improve, the need for this equipment will inevitably increase.

So far, equipment vendors have sold primarily to joint ventures and to international environmental protection organizations.

### Conference Sets Target on Control of Urban Pollution

OW2008043291 Beijing XINHUA in English 1429 GMT 19 Aug 91

[Text] Changchun, August 19 (XINHUA)—China's second national conference on urban environment protection closed today in Jilin city, Jilin Province.

Mayors from 98 Chinese cities and officials from 17 ministries and commissions of the State Council participated in the conference.

The conference set a target of taking urban pollution under control by the end of this century.

The participants expressed the belief that since the first conference in October 1985, the environment in Chinese cities has been improved to some extent. However, they noted that urban residents still suffer from severe atmospheric, water, garbage and noise pollution.

The participants said that comprehensive administration is necessary to combat pollution. Infrastructure facilities, including coal and gas supplies, water supply and drainage networks, and waste treatment should be improved. They also stressed that traffic conditions should be upgraded and green-covered zone should be enlarged.

The conference announced the outcome of the first environment examination of the state's 32 key cities. Dalian City ranks first. The second to tenth on the list respectively, are Hangzhou, Beijing, Tianjin, Changsha, Nanchang, Haikou, Wuhan, Suzhou and Guangzhou.

#### Poaching, Trafficking in Wildlife on Increase in South China

OW2708023491 Beijing XINHUA in English  
0117 GMT 27 Aug 91

[Text] Beijing, August 27 (XINHUA)—Trafficking in wildlife is rampant in south China's Guangxi Zhuang Autonomous Region and railway police there are keeping close watch on lines known to be used for the trade, according to Sunday's "GUANGMING DAILY."

Guangxi is home to 38 kinds of rare wild animals which are protected under national laws.

The paper said that traffickers buy wild rare animals from poachers in the counties of Rong'an, Pingxiang and Ningming, as well as Jingxian County in Hunan Province, and ship them through the rail network to sell in the cities of Guangxi and neighbouring Guangdong Province.

To avoid inspection by the railway police, the traffickers throw wild animals out of the train to their accomplices as the train pulls in, the report says.

Policemen from the Liuzhou Railway Administration found giant lizards and pangolins weighing about 90 kilograms on one train.

At Nanning Railway Station since last year police have discovered a bear, 39 monkeys, giant lizards weighing 88 kilograms and 150-kilogram pangolins, which are covered by the state's first and second grade protection laws.

Poaching and trafficking in wild animals has been increasing, and stopping the illegal practices has become

more and more difficult although the State Council has issued several sharply-worded regulations.

In the eastern coastal areas of Guangdong and Fujian, illegal export of wildlife to Hong Kong, Macao, the United States and Japan has been spreading rapidly.

Many Chinese hotels and restaurants, especially in south China, have a long-standing tradition of offering meals containing the meat of wild animals.

Chinese officials say that poor awareness of wildlife protection laws and weak police enforcement are to blame for the situation.

The China Wildlife Conservation Association has set up branches in 27 provinces, municipalities and autonomous regions employing about 30,000 staff.

More publicity campaigns are likely to be launched, the paper said.

#### Official Calls for Coordination of Population, Resource, Environment Policies

OW2708132191 Beijing XINHUA in English  
1301 GMT 27 Aug 91

[Text] Beijing, August 27 (XINHUA)—A State Science Commission official has urged the public to pay attention to the country's ecological problems such as over-population, shortages of natural resources and deteriorating environment.

Deng Lin, chief of the Social Development Department under the State Commission of Science and Technology, made the appeal in a study published in the first issue of the journal CHINESE POPULATION, RESOURCES and ENVIRONMENT, an academic journal, which will be officially launched tomorrow. Deng Xiaoping wrote the title of the journal.

According to Deng Lin, the population growth has gravely hampered China's economic development and the improvement of the people's living standard.

"Every year, one fourth of the new increase in the national income is eaten up by the increase in the population, greatly handicapping China's modernization program," she wrote.

According to her, China loses 460,000 ha of arable land each year owing to capital construction and soil erosion and the forests are shrinking annually by 100 million cubic meters.

"It is estimated that environmental pollution and ecological destruction have caused China direct or indirect economic losses totalling at least 100 billion yuan," she said.

"Global environmental problems such as acid rain, the greenhouse effect, the rise in the sea level and depletion of the ozone layer are also posing threats to China's economic and social development," she warned.

She urged people from all walks of life to pool their efforts to solve the problem of coordinating population, resources and environment policies.

"While it is necessary for government leaders and policymakers to continuously seek new ideas, new methods and new measures to deal with these problems, and for our scientists to continuously study these problems, it is more important to arouse understanding among all the people, particularly among the intellectuals," she said.

### **Northern, Coastal Area Cities Face Water Shortages**

*HK2908051091 Beijing CHINA DAILY in English  
29 Aug 91 p 1*

[By staff reporter]

[Text] Some 300 Chinese cities are faced with a shortage of water supplies as a result of the rapid economic growth and population boom in recent years, according to a report in the China Water Resources News, a paper sponsored by the Ministry of Water Resources.

Of the cities, more than 100 were suffering from severe water shortages, and 30 did not even have any water resources worth exploitation, Wu Guochang, director of the ministry's department of water resources, said.

These 300 cities suffer from a total estimated 5 billion cubic metres of water shortage every year, reducing their annual output value by 80 billion yuan.

Mainly located in the country's northern and coastal areas, these cities included Dalian, Qinhuangdao, Beijing, Tianjin, Yantai, Ningbo, Shenzhen, Xiamen and Xian.

Water shortage has not only effected their economy, but also influenced resident's daily life, forcing them to queue for water as hydraulic pressure remained insufficient to take the water to their homes.

Though many historical factors also influenced the water shortage, Wu put the major blame on China's rapid economic development and the population increase.

While the population increases by 10 million each year, the country's average annual industrial and agricultural growth rates in recent years, have reached 11.4 and five percent respectively.

This growth has made increasing demands on the water supplies, but unfortunately, the official said, the development of water supply projects has not kept pace with other major areas of city infrastructure, such as energy, communications, raw materials and urban construction.

The increasing amount of untreated waste water discharged by enterprises into rivers and lakes has also added to the deterioration of the country's water environment as a whole.

Another major factor that caused the shortage was the lack of general policy governing the State water resources' investment and management on the existing water supply facilities. Wu said that the drawing up of appropriate policy was "an urgent task that should be settled as soon as possible by decision-making bodies."

Current water prices lower than its actual cost were also weakening the government's efforts to encourage conscious efforts to save water by the whole of society.

Though the problem was serious, Wu was confident about tackling it, describing the water shortage as "a difficulty which could not be avoided on the road to economic development."

Wu urged that in mapping out urban economic plans, the government should take the water situation into account and give priority to key water resource projects, bearing in mind that nothing could be achieved without adequate water supplies.

This was to urge top government decision-makers to make more efforts to get construction of its long-proposed ambitious water supply programs underway, including the project to divert water from the Yangtze River and send it to thirsty North China.

### **World Bank Loan To Aid Xinjiang Agriculture, Environment**

*HK0309100591 Beijing CHINA DAILY in English  
3 Sep 91 p 2*

[By staff reporter Xiao Wang: "Bank Loan To Assist Farming in Xinjiang"]

[Text] The World Bank announced in Washington last Friday the approval of a loan of \$125 million to aid agricultural and environmental development in the Xinjiang Uygur Autonomous Region of Northwest China.

The loan will come from the bank's "soft-loan" arm, the International Development Association and will be executed over a five-year implementation period.

According to a statement released by the World Bank's resident mission in China, the proposed Tarim Basin project is designed to increase agricultural production and rural incomes in the Yerqiang and Weigan basins by financing productivity increases on existing low-yield farmland, efficient development of unused wastelands, and increases in livestock production.

The project also would incorporate measures to restore the natural ecology and monitor environmentally sound development of the Tarim Basin.

The project covers irrigation and drainage, hydroelectric power development, agricultural support services, livestock support services, and restoration of the Tarim River ecological systems.

The irrigation and drainage will cover improvements in the main irrigation systems, development of ground water wells, improvement of low yield areas (120,000 hectares), and expansion and reclamation of wasteland (80,000 hectares).

Hydropower development will include the construction of one 21 megawatt generating station in Yerqiang and the interconnection of four country-based systems to serve the needs of the region.

#### Western China Development, Environmental Protection Viewed

*OW0509052791 Beijing XINHUA in English  
0016 GMT 5 Sep 91*

[Text] Xining, September 5 (XINHUA)—Experts attending an international seminar convened to discuss development and the environment in western China urge that in the development effort special attention be paid to environmental protection.

Western China includes the 11 provinces and autonomous regions located in southwest and northwest China.

The experts pointed out that environmental conditions in the area will not only affect the smooth and steady development of the area itself, but will also affect the development of east China, as well as many Southeast Asian countries.

For example, the Qinghai-Tibet Plateau is the source of all China's major rivers, as well as most large rivers in Southeast Asian countries. Therefore, environmental conditions on the plateau will have profound affects on the climate in the eastern part of the world, according to the experts.

Over 60 experts and scholars from both China and a number of foreign countries are attending the seminar.

#### Controls Sought for Growing Acid Rain Problem

*OW0709033891 Beijing XINHUA Domestic Service  
in Chinese 1313 GMT 6 Sep 91*

[By reporter Zhu Youdi (2612 1635 2769)]

[Text] Beijing, 6 Sep (XINHUA)—State Councilor Song Jian said today at the 20th meeting of the State Council's Environment Protection Committee that it is extremely urgent to control the nation's growing acid rain problem. The main task today is to bring sulfur dioxide emissions under control, with the emphasis on sulfur dioxide emissions from industrial coal use that accounts for up to 70 percent of total coal consumption.

According to information, with increases in the nation's industrial production, consumption of nonrenewable energy resources has risen 63 percent in the past decade and that of coal 70 percent. At the same time, sulfur dioxide emitted by coal burning rose proportionally. Consequently, acid rain has grown more serious with

each passing day: acidity in precipitation has risen, acid rain has become more frequent, and more areas have been polluted. The area that covers Guangdong-Guangxi Basin, Sichuan Basin, and most of Guizhou Province has become one of the three largest acid rain zones in the world, standing side by side with North America and Europe. Acid rain is also growing in east China, and an acid rain zone that centers around Nanchang, Xiamen, Fuzhou, and Qingdao is forming. Areas affected by acid rain have seen a drop in grain production, devastation of the environment, and huge economic losses.

Song Jian said: Levying a pollution tax on sulfur dioxide is one measure for controlling sulfur dioxide emissions from industrial coal burning. Developing low-sulfur coal and other pollution-free energy resources is also a way of controlling pollution. Thanks to scientific and technological research and technology imported during the periods of the Sixth and Seventh Five-Year Plans, we have now developed and conducted economic evaluation of a host of technologies for treating sulfur dioxide from industrial coal burning. Because the industrial sulfur dioxide discharge tax has not been introduced yet for the time being, it is quite difficult to put these technologies into wide use. From now on, we should exercise control over the sulfur dioxide discharge of newly launched projects and tighten screening and approval procedures. Step-by-step introduction of a sulfur dioxide emissions tax will help localities speed up comprehensive tackling of the sulfur dioxide emissions problem.

The State Council Environment Protection Committee has set a goal of controlling acid rain in this century. It calls for keeping industrial sulfur dioxide emissions in the year 2000 to 1990 levels. Taking into account continued increases in coal consumption, this means that we will have to cut sulfur dioxide emissions by 5 million tons. By that time, the amount of sulfur dioxide discharged from industrial boilers, boilers at power plants, and industrial furnaces will drop sharply.

The meeting also examined a report on the situation of Chinese river dolphins and measures to protect them.

#### Shanghai Recycles Coal Ash Into Building Materials

*OW1109125691 Beijing XINHUA in English  
0651 GMT 11 Sep 91*

[Text] Shanghai, September 11 (XINHUA)—Huge piles of coal ash, once a headache for environmental protectionists in Shanghai, are now being processed into building materials, according to a paper presented at an international seminar here on Wednesday.

The wide use of the fossil fuel in the largest municipality in China has meant the city has a great amount of solid

wastes. In a ten-year period, the annual amount increased from 700,000 tons to 2.52 million tons.

With the support of the State Planning Commission and the Ministry of Construction, Shanghai scientists have developed strong and durable building materials using primarily coal ash.

The coal ash recycled by the building industry of the city amounted to 1.37 million tons in 1989, 68.7 percent of total coal ash discharges for the year.

Under the sponsorship of the United Nations in November 1990, a class was opened to students from eight countries to teach the recycling technique.

## REGIONAL AFFAIRS

### France Claims Clean Bill for Pacific Nuclear Test Zone

*BK2308023891 Hong Kong AFP in English 0127 GMT 23 Aug 91*

[By Michael Field]

[Text] Wellington, Aug 23 (AFP)—The International Atomic Energy Agency (IAEA) has reported insignificant levels of radioactivity at the nuclear weapons test sites in French Polynesia, the French Embassy said here.

The embassy was quoting late Thursday from a IAEA report which had yet to be officially released, although an IAEA spokesman in Vienna confirmed which man-made radioactive materials had been found and their quantity.

The environmental organization Greenpeace accused the embassy of being "rather dishonest" in the way it released the report.

France has conducted nuclear tests at Mururoa and Fangataufa since 1966. Atmospheric tests ended in 1974.

In an eight-page statement the embassy here said it was "pleased" to announce the IAEA's results which it said fulfilled all criteria for "objectivity and scientific integrity" and was based on water and plankton samples taken in March 1991.

Samples were tested by the Joint Services of Radiological Safety of the Pacific Experimentation Centre (CEP) in Tahiti, the International Laboratory of Marine Radioactivity of the IAEA and the Lawrence Livermore National Laboratory in the United States.

"The report confirms that the incidence of radioactivity in the nuclear testing zone is no different to that in the rest of the South Pacific, one of the least radioactive zones in the world," the embassy said.

"The amount of natural radioactivity present is far greater—by a factor of a thousand, or even ten thousand times—than that of artificial radioactivity," said the embassy drawing its own conclusions from the report.

It said the artificial radioactivity consisted solely of traces of the isotope caesium 137 (137c), strontium 90 (90sr) and plutonium and these were "fallout from earlier atmospheric tests."

The embassy said the IAEA had found "extremely small" traces of artificial radioactivity.

"All that was found were traces of the earlier atmospheric tests, carried out by France and other countries—results totally consistent with what is observed elsewhere in the South Pacific or South Atlantic oceans."

Greenpeace sent its ship Rainbow Warrior II to the test site last November and attempted to sample the water

inside Mururoa Lagoon. But French military arrested several Greenpeace members and prevented them from carrying out tests.

Greenpeace said French scientist Jacques Cousteau reported in 1987 that his Calypso crew had detected 134c (with a half life of two years) and 137c in the lagoon. The organization concluded this was evidence of leakage from Mururoa, it being too recent to be left over from atmospheric tests.

The embassy claimed Thursday that Greenpeace misinterpreted "a few misprints" in the Cousteau report and said the Pacific Experimental Centre (PEC) laboratory at Mururoa could find no traces of 134c.

"Several hypotheses were then put forward by the scientist responsible for these analyses, one of which being the possible disruption of measurements, carried out in Paris, due to traces of radioactive fallout from Chernobyl," the embassy said.

It said the IAEA contradicted Greenpeace since it showed a "total absence of cesium 134 and of cobalt "which goes to prove that some recent allegations of supposed radioactive leakage attributable to the underground tests...were unfounded."

"Most of the measured concentrations were at levels which could be expected as a result of worldwide fallout," the embassy said.

Greenpeace anti-nuclear campaigner Stephanie Mills told AFP that it was hard to react to the embassy's statement as the organization had not seen the IAEA report. "What they have done here is a propaganda exercise...its their government's way of putting their own gloss on the report before it's released," she said.

Greenpeace did not regard the IAEA as an objective body, and claimed it had a vested interest in the nuclear industry, she said. The Livermore Laboratory was the United States Government nuclear weapons laboratory.

She said the French Embassy had tried previously to claim the 134c recorded was from Chernobyl. But, she said, there had been no measure of 134c at any other site in the southern hemisphere at that time.

The IAEA report did not report on the waters inside the lagoon, she said. "We have always acknowledged that our own science was not as adequate as we would have liked.

"But they cannot have it both ways; the French did not allow us to test inside the lagoon.

### Thailand Seeking Long-Term Logging Pact With Burma

*BK2608015991 Bangkok BANGKOK POST in English 26 Aug 91 p 28*

[Text] Burma's minister for agriculture and forests, General Chit Swe, will be invited to Bangkok for talks on

Thai logging concessions in Burma. The Minister for Agriculture and Cooperatives, Anat Aphaphirom, told BUSINESS POST at the weekend the Forest Industry Organisation (FIO) had approved a plan to invite the minister to visit Thailand soon.

The FIO wanted Thailand's logging concessions in Burma to continue after a two-year agreement expired in June this year, Dr. Anat said.

If the Burmese minister could not come to Bangkok, Dr. Anat would send high-ranking FIO and Department of Forestry officials to Burma.

Burma wanted to award the FIO a year-by-year concession, while the FIO wanted to reach a long-term agreement at a reasonable price, he said.

The organisation had approved a two-million-baht donation to Burma to help people suffering from the recent floods.

It was likely Burma would not renew logging concessions to private companies, but the FIO was in a stronger position because it was a state organisation, he said.

Under the previous concession, the FIO was allowed to log a large area of forest opposite the Prachuap Khiri Khan Province.

The FIO deposited a US\$50,000 letter of credit with the Burmese Government for the timber removed.

An FIO source said the organisation needed the timber to meet local demand. It was currently looking at obtaining timber from other sources.

Meanwhile, Dr. Anat said the Ministry of Agriculture planned to publish a handbook for farmers as part of a four-point plan to help improve their standard of living.

The first part of the plan, which has been approved by the Cabinet, involved improving research and development in agricultural areas to give farmers more enterprise choices.

The second part of the plan included assistance for farmers in planning, and the provision of 2,000 million baht from the Bank for Agriculture and Agricultural Cooperatives for long-term credit to farmers in 42 provinces.

Thirdly, the ministry would establish a 1,000-million-baht land fund to secure property for farmers who had no land to cultivate.

The land fund would be upgraded to be a Land Bank after its funds increased to 5,000 million baht.

Finally, the plan involved helping three million farm area people who had no land to find jobs.

Dr. Anat said the ministry had accelerated the plan so it could be underway soon after the National Legislative Assembly approved the budget.

### International Conference on Asia Regional Air Pollution Held in Seoul

SK0409063191 Seoul *THE KOREA TIMES* in English  
4 Sep 91 p 3

[Text] The 2nd IUAPPA (International Union of Air Pollution Prevention Associations) Regional Conference on Air Pollution opens today for a three-day run at the Swiss Grand Hotel in western Seoul.

Organized by the Korea Air Pollution Research Association (KAPRA) under the theme of "Emerging Issues in Asia," the event provides a forum for the discussion of wide-ranging topics on regional air pollution such as the increasing presence of sulfur gases in the atmosphere.

Some 100 environmental experts from 22 countries, including Japan, the United States, the Soviet Union, Germany, Britain, India and Canada, will present a total of 104 papers.

The conference is only the second since it was introduced by IUAPPA last year, the organizers said. The meeting is held as a supportive event of the World Clean Air Congress which convenes every three years and the 9th congress will open in Montreal, Canada next September.

While staying in Korea, the participants of the conference will visit a number of industrial companies and historic sites. Environment Minister Kwon I-hyok is scheduled to throw a welcoming reception this evening.

Korea recently became one of only 13 Executive Committee member countries of IUAPPA.

### HONG KONG

#### Factory Fined Record \$12,000 for Pollution

WA0823133591 Hong Kong *SOUTH CHINA MORNING POST* in English 17 Jul 91 p 3

[Text] Hong Kong's largest fine—of \$12,000—has been handed down to a Kwun Tong factory for emitting clouds of dense black smoke, giving a boost to environment officials who have campaigned for higher penalties to deter offenders.

But an Environment Protection Department official said they were disappointed by the generally low fines for pollution offenses.

Tai Yip Dyeing Factory, of Wai Yip Street, received the fine for its ninth conviction, according to the department's monthly list of offenders, released yesterday, which showed a record 57 convictions.

Mr. Franklin Chung, of the department's air control group, said the plant emitted large amounts of smoke for more than 10 minutes on 16 April.

The previous highest fine was \$8,000, handed down to several factories since 21 September when the maximum amount for such an offense was increased from \$5,000 to \$20,000.

"We think \$12,000 is close to a heavy fine. Whether it will be sufficient to prevent future smoke [pollution] remains to be seen," Mr. Chung said.

Twenty four convictions carried fines of \$5,000 or less, despite repeat offenses.

#### Kowloon Water Pollution Study Set

WA0823110691 Hong Kong *SOUTH CHINA MORNING POST* in English 31 Jul 91 p 6

[Article by Kathy Griffin]

[Text] Sewers and the flow of pollution in an area stretching from Tsim Sha Tsui to Wong Tai Sin would be the subject of a study starting today, the Environmental Protection Department (EPD) said yesterday.

The five-month study is part of a larger 20-month water pollution scrutiny of north and south Kowloon commissioned in April, and will be one of the last areas on Victoria Harbour to be assessed. Only Hong Kong Island from Wan Chai to Chai Wan remains.

In addition to monitoring the pollution and condition of the sewers, unsewered areas will be identified as well as sewage discharges down storm drains and watercourses, which are only supposed to carry rain water.

The causes of blockages and premature deterioration of sewer pipes will also be determined, and much of the work will be done at night to avoid disrupting traffic.

The information will then be used to draw up remedial improvements to control pollution going into the harbour from the area.

All waste water is supposed to go down foul sewers which take it to screening plants, but officials estimate half goes down storm drains and straight into the harbour, causing serious pollution.

Improvements to the sewerage and a new system for disposing of the waste has been proposed in a \$20 billion plan to clean up the territory's waters.

The north and south Kowloon study is one of 21 sewerage master plans undertaken by the EPD as part of that plan.

North and south Kowloon covers Tsim Sha Tsui, Hung Hom, To Kwa Wan, Kowloon City and Wong Tai Sin. The total cost of the 21-month study is \$18 million.

The release of a progress report of a sewerage master plan study is unusual as the EPD normally only makes announcements when a study is commissioned.

#### Industry Disputes Antipollution Levy on Chemical Imports

WA0823125091 Hong Kong *THE HONG KONG STANDARD* in English 2 Aug 91 p 7

[Article by Kathy Griffin]

[Text] A proposed antipollution levy on all imports of chemicals has come under fire from the Hong Kong General Chamber of Commerce which wants more debate on who should pay for cleaning up the environment.

The levy of an average 0.75 percent over 15 years is intended to cover the cost of treating chemical waste, which often gets flushed straight into the harbour and food chain, posing health and environmental risks.

The Planning, Environment and Lands Branch proposed the levy in a consultative paper which estimates that \$340 million could be raised each year.

The money would enable the capital cost of a \$1.3 billion chemical waste treatment plant on Tsing Yi to be paid off in 15 years, as well as cover its operating costs. The plant is to be commissioned late next year.

But acting chamber director Mr. Harry Garlick said his members felt the levy was highly unfair.

"Over 40 percent of chemical imports into Hong Kong are reexported and it's a lucrative trade. But the point is, reexports can't create any pollution in Hong Kong," he said.

"The other point is that companies like Shell, which have spent millions on anti-pollution control, say they aren't creating the problem. It's the small cowboy operators in Wong Tai Sin who are flushing it down the drain. It's asking the responsible people to subsidize the irresponsible people."

Mr. Garlick said the issues went deeper than just chemical waste treatment.

"It seems to us that in Hong Kong, society as a whole is at a very crucial stage in the development of the fight against pollution.

"We think the whole question of who pays for pollution control should be ventilated," he said.

Mr. Garlick said there were three options—industry pays, the polluters pay, or taxpayers pay—and discussion was needed between industry associations, government and other affected parties for an acceptable solution.

The Government had so far opted for "industry pays," but Mr. Garlick said this was not always fair, as the issues raised in the chemical waste debate showed.

"Also, it's not just an industry problem. But the Government likes 'industry pays', it keeps it simple and keeps taxes down," he said.

Putting the onus on the polluter had its own problems, particularly as heavy polluters might either find a way around the regulations, regard any fines as the cost of doing business rather than improving operations, or move to China. It would also be extremely difficult to police, Mr. Garlick said.

## JAPAN

### Legislation Planned To Force Firms To Recycle Nickel-Cadmium Batteries

OW3008004091 Tokyo KYODO in English 2351 GMT  
29 Aug 91

[Text] Tokyo, Aug 30 KYODO—Japan plans legislation to oblige electric firms to recycle nickel-cadmium [ni-cad] batteries, widely used in computers and other electric appliances, a Japanese industrial daily reported Friday.

The NIHON KOGYO SHIMBUN said the laws are expected to take effect as soon as in October after policy coordination among ministries, including the Ministry of International Trade and Industry and the Health and Welfare Ministry.

Home appliances to be regulated will be limited to television sets, air conditioners, refrigerators, and washing machines, but all office equipment, such as computers, will be included, the daily said.

Along with the legislative measures, five industries—automobile, steel, chemical, pulp paper, and metallurgy—will be required to launch self-imposed rules to help in recycling ni-cad batteries, it said.

### Environemnt Agency Bill Plans Stricter Car Emission Controls

OW0209121191 Tokyo KYODO in English 1134 GMT  
2 Sep 91

[Text] Tokyo, Sept 2 (KYODO)—The Environment Agency plans to submit a bill to the next regular Diet session aimed at reducing the amount of nitrogen oxide emitted from automobiles, agency sources said Monday.

The bill covers urban districts of Tokyo, Osaka, and Kanagawa Prefectures with the government setting the maximum permissible amount of nitrogen oxide for every office and factory in those areas, the sources said.

The government will guide the enterprises and factories in curbing the emission of nitrogen oxide below the limit and promote conversion of diesel-powered automobiles to gasoline-fueled ones and creation of low-pollution vehicles, they said.

Diesel engines emit more nitrogen oxide than gasoline engines. In the case of small trucks, the emissions are reduced by 75 percent to 90 percent when converted from diesel to gasoline.

There are some 1.2 million diesel buses and trucks in the three prefectures.

The government may call on enterprises to reduce the number of vehicles and their mileage, the sources said.

The agency will draw up the bill based on the final report of an agency commission to be compiled in the fall.

### Report Shows Economic Growth Possible Despite CO<sub>2</sub> Controls

OW0409164991 Tokyo KYODO in English 1230 GMT  
4 Sep 91

[Text] Tokyo, 4 Sept (KYODO)—High economic growth could be attained even if measures to control carbon dioxide emission are enforced to prevent global warming, a private Japanese research institute said Wednesday.

The Global Industrial and Social Progress Research Institute thus challenged generally accepted concern that such measures would depress global economic growth.

The institute said a computer-aided projection showed that high economic growth is possible in the year 2000 even if the amount of CO<sub>2</sub> emission is held at the 1990 level.

The projection was based on the assumption that advanced nations coordinate in taking two steps to control the amount of CO<sub>2</sub> released in the atmosphere.

The measures are:

- introduction of a 10 percent “carbon tax” and curbs on investment in plant and equipment.
- a 15 percent cut in oil consumption and increased expenditures for research and development for controlling CO<sub>2</sub> emission by a uniform 0.2 percent of gross domestic product.

The institute said that if the first measure were enforced, the annual economic growth rate through the 1990s was projected at an average 1.7 percent, lower than an estimated 2.9 percent in case no measures are enforced.

If the second measure were enforced, the institute said economic growth would be higher at 2.98 percent.

If the two measures are combined, the institute said, the average growth rate would be 2.6 percent.

Similar results were obtained on a theory that not only advanced nations but other countries around the world put into force measures to control the CO<sub>2</sub> emission, the institute said.

## SOUTH KOREA

### Regulation of 54 Environmentally Harmful Products Marks Government's Preliminary Step Toward Montreal Protocol

*SK2808042391 Seoul THE KOREA HERALD  
in English 28 Aug 91 p 6*

[Text] The use of 54 environment-destroying materials vital for the manufacture of various industrial products will be regulated by the government beginning next year.

According to a draft bill restricting the manufacture and use of the "controlled" substances for the purpose of protecting the ozone layer, those firms which want to start the manufacture of any one of the 54 substances, including CFC (chlorofluoro carbon) and halon, will be obliged to obtain the approval of the Ministry of Trade and Industry three months prior to the business commencement.

The existing makers and importers of these materials will have to tender their planned manufacturing and importing amounts for the following year every Sept. 30 to the ministry, officials said.

The ministry's move is a preliminary stage for the Seoul government to accede to the Montreal Protocol, aimed at freezing the use of these harmful materials to protect the ozone layer during the first half of next year, they said.

The protocol stipulated a severe trade disadvantage on countries which heavily use the materials but do not accede to the protocol such as by banning their import of materials for the substances which are vital for the manufacture of refrigerators, air conditioners and other industrial products.

## MALAYSIA

### Forest Policy Conflict Cited as Reason for Boycott of Rio-92 Conference

*BK1908145591 Kuala Lumpur Voice of Malaysia  
in English 0800 GMT 19 Aug 91*

[Station Commentary by John Doraisamy]

[Text] Malaysia may not be represented at the earth summit which is planned to take place in Brazil next year. It is important that this decision should be understood in its full perspective.

Environmental issues are of immense relevance to the entire human race. However, their sense of urgency should not lead to a conflicting viewpoint or an obsession with one or two ideas.

In recent months, Malaysia has become the victim of a vicious campaign mounted by environmental groups in some industrial countries. These people have been depicting Malaysia as a country that has been and still is insensitive to the environment.

It is Malaysia's forest policy that has become the focus of attention. The truth is that Malaysia recognizes the vital importance of the environment. There is a ministry staffed by professional officers to handle all matters concerning the environment and related issues. In addition, there are some active voluntary bodies that spread knowledge about the environment among the people. At least two of them are known internationally. The smear campaign against Malaysia is quite ridiculous and uncalled for.

Malaysia's Prime Minister Dr. Mahathir Mohamed has stressed that the preservation of the environment cannot be regarded as a problem that offers an easy solution. There have to be worldwide and concerted efforts. There are for example, several dimensions involved—marine pollution, air pollution, soil erosion, forest recession and the ozone layer are all vital aspects.

It is therefore hardly of any use to catch hold of the few isolated instances and exaggerate them. That is exactly what is being done in respect of Malaysian timber and our tropical forest. The Malaysian state of Sarawak has been picked out by the environmentalists as an ideal target. They have not hesitated to break the law in an attempt to frustrate the timber industry. The illegal entry into the state and physical tampering with properties belonging to timber companies have been proved beyond doubt.

Of course it would be absurd to expect the authorities concerned to keep quiet in the face of such a serious actions. There have been some arrests and deportations. Immediately, the environmentalists become heroes and martyrs. The Malaysian Government becomes the object of more criticism. The complete lack of objectivity in the proenvironment movement can only lead to more misunderstandings and harm.

Malaysia will not attend the earth summit if it is intended to be a scapegoat-seeking exercise. Hopefully, the environmentalists will see things from an objective perspective and stop attacking Malaysia.

### Malaysia Seeking Timber Markets, Joint Ventures in Middle East

*BK1908155191 Kuala Lumpur BERNAMA in English  
1046 GMT 19 Aug 91*

[Text] Kuala Lumpur, Aug 19 (OANA-BERNAMA)—Malaysia will depend on its brotherly ties with fellow Islamic countries in West Asia to thwart attempts by environmentalists to sabotage Malaysia's timber trade, Deputy Primary Industries Minister Tengku Mahmud Mansur said Monday.

He told a news conference here that, fortunately, West Asian countries have high regard and respect for Malaysia, and "feelings of animosity, if any, are minimal".

The impact of the global protest against Malaysia's timber trade, launched by environmentalists claiming to be serious about saving the rainforests, was being felt more in the United States, Australia and Europe, he added.

Nevertheless, he would take advantage of the 19-day timber technical and promotion mission he will be leading to West Asia from Tuesday to enhance Malaysia's "brotherhood relationship" it enjoys with those Islamic countries.

His 17-member Malaysian delegation will visit the United Arab Emirates, Saudi Arabia, Iran and Turkey, beginning Tuesday.—more

Asked whether the mission was part of Malaysia's efforts to seek new and expand existing timber markets in the wake of the global assault on Malaysia, he said: "There may be some connection." The mission will seek markets for Malaysia's timber products as well as possible timber-based joint ventures.

Tengku Mahmud said Malaysia regarded the Middle East as a very important market for Malaysian timber and timber products, particularly Iran, which has launched a five-year plan to develop its economy. These products are also exported through third countries, particularly Singapore.

Last year, Malaysia sold to West Asia countries some M\$159 million (about US\$58 million) worth of sawn-timber and M\$64 million (about US\$23 million) worth of plywood.

#### **Ecologist Warns of 'Jet Set' European Environment Groups**

*BK2408155191 Kuala Lumpur NEW STRAITS TIMES  
in English 21 Aug 91 p 9*

[Text] Kuching, Tuesday—Malaysia must be on guard against certain European environmental groups who have raised tens of millions of ringgit over the past year to right the nation.

The warning came from Dr. Eberhard Bruenig who is director of the Institute of World Forestry and Ecology and a professor of world forestry at the University of Hamburg.

Dr. Bruenig said in an interview here that people in Europe should also be warned against such groups because most of the donations had been "invested in banks" while the rest was used by environmentalists who travel by air "business class" while conducting their so-called antilogging campaigns.

He said it was widely believed that only less than 20 percent of money donated by the public for environmental campaigns was used for actual anti-logging operations.

One of the groups which has raised millions of dollars is the Greenpeace movement. He believed that two other groups—the German-based Robin Wood group and Society For Threatened Peoples (a Swiss group) had the same motives.

"There are groups which are highly active, financially affluent and who survive by highlighting problems and conflicts like that of the Penan. Such groups do not fight for the rainforests, people or the environment but for money, power and jetset lifestyle.

"It is sad that those who are serious and sincere in improving the conservation and management of the rainforests are in a hopeless situation because of them," he said.

Dr. Bruenig is no stranger to Sarawak because he first worked in the State from 1954 to 1963 in the Forestry Department. Since then he has been returning to the State to carry out research on forestry.

Dr. Bruenig who is here for a six-week stint which ends next week said that he personally received regular telephone calls by people asking him to donate to the "Save the Penan" fund and was given a bank transfer form to fill.

This is the modus operandi of environmental groups who send millions of such letters to would-be donors each year. For example one Greenpeace movement leader alone had 1.6 million addresses in documentation.

He pointed out that the July issue of the Austrian magazine THE VIENNA also exposed the Greenpeace movement whose boss was said to be connected with a Western intelligence agency and having raised 70 million German marks (about \$110 million) this year.

The magazine alleged that the leader of the group was an international "jetset playboy" with connections with a major intelligence agency [public relations] giant. It claimed that for every \$1 million German marks [as published] invested, the movement received \$7 million in donations in return.

THE VIENNA also said that donors of funds had been could be "cases of fraud, lying, misappropriation."

It also made many other allegations including the fact that such environmental groups would even go to the extent of hiring people to slaughter baby seals "in order to get a good picture."

Dr. Bruenig said the groups which were well-organised and internationally connected could create a lot of problems as it did when a group of Western environmentalists managed to carry out an anti-logging demonstration in Kuala Baram in Miri recently.

The group's preplanned action had the support of foreign news agencies which were on hand to cover the "incident".

"Public relations and marketing management of Greenpeace, Robin Wood (a German environmental group) and other groups are superb because they are in the hands of professionals and experts. The recent distasteful happening at Kuala Baram indicates features of excellent planning and implementation.

"The timing (of the demonstration in Kuala Baram) is ideal because it is holiday season in Europe, United States and Canada when people have time to watch television and read newspapers leisurely. It is also ideal because many foreign journalists and TV crews were in northern Sarawak then to cover an international seminar and centenary celebrations of an international company."

Dr. Bruenig said what he was interested in was helping to develop a close and long-term partnership between Germany and Sarawak to achieve sustainable forest utilisation, management and conservation.

"We believe in solving problems by cooperation and not confrontation. The emphasis must be on partnership, research and development," he added.

His research in Sarawak is being financed by the German Research Foundation and Volkswagen Foundation.

#### **Government Planning Document To Rebut Developed Countries on Environment**

*BK2908114791 Kuala Lumpur BERNAMA in English 0958 GMT 29 Aug 91*

[Text] Kuala Lumpur, Aug 29 (OANA/BERNAMA)—Malaysia's plan to publish a special document to counter the propaganda of developed countries on the environmental situation in developing countries received encouraging response from the Third World, a minister said Thursday.

Science, Technology and Environment Minister Law Hieng Ding said that as such Malaysia would go ahead with the plan and continue to fight for the rights of the developing countries in matters relating to the environment.

Feedbacks showed that the other developing countries were also of the opinion that there was a need for efforts to counter the propaganda.

They also felt that the developed countries should understand their responsibilities towards the environmental problem faced by the world.

Law, however, did not name the countries which supported Malaysia but said that the document "Greening the World" was in the final stage of preparation. It would first be submitted to the Cabinet for approval.

He said the document, to be accompanied by a documentary and pamphlets, was being prepared by the Institute for Strategic and International Studies (ISIS) with the cooperation of his ministry, the Ministry of

Primary Industries, the Foreign Ministry, and the Implementation and Coordination Unit (ICU).

Law said the document would later be distributed at the Commonwealth Heads of Government Meeting (CHOGM) in Zimbabwe in October.

The document would also be distributed at the preparatory meeting of the United Nations Conference on Environment and Development (UNCED) in Brazil next year. The preparatory meeting would be held in New York soon.

He said Malaysia could prove that it had a larger green area than some of the developed countries, that is 74 percent of the total land area.

Earlier, in his speech at the presentation of "excellent service" awards to 23 staff of the ministry, he said a comprehensive policy on environment would be drafted soon.

It would be drafted by the National Environment Council which would be set up soon.

He said the council would function as a coordination body for all agencies involved in environmental matters.

Meanwhile, the Science, Technology and Environment Ministry today disputed the statement by the World Wide Fund for Nature (WWF) that exhaust emissions of nitrogen oxide and carbon dioxide from aircraft might be adding substantially to global warming.

It said that the transport sector contributed less than 15 percent to the total emissions and that air travel contributed less than 1.5 percent of the total potential problem.

The ministry said first priority should be given to improve efficiency of energy use and conservation, particularly in the electric utility, motor vehicle industry, and the manufacturing sector.

#### **TAIWAN**

**Taipei To Comply With UN Ban on Drift Nets**  
*OW2208105791 Taipei CNA in English 0808 GMT 22 Aug 91*

[Text] Taipei, Aug 22 (CNA)—Taiwan will comply with a United Nations decision to suspend driftnet fishing by June 30, 1992, the Council of Agriculture (COA) said Wednesday.

The UN decided on 22 December 1989 to require that member countries completely ban large driftnet fishing boats from operating on the open seas after July 1, 1992 in order to better protect marine life and ecology.

The Republic of China, Japan, and South Korea had submitted driftnet fishing research reports assessing the impact of such fishing on oceanic resources to the UN for reference and the UN is expected to make a final decision on the future of open seas driftnet fishing.

The Republic of China has banned driftnet fishing in the Atlantic and the South Pacific, but currently has 300 driftnet fishing boats operating in sanctioned areas of the North Pacific and the Indian Ocean. These vessels are, however, prohibited from fishing for salmon and trout and the government imposes heavy penalties on offending fishing boats and their skippers.

It will be a big blow to local driftnet fishing boats if the UN enforces its ban next July.

In the face of the coming worldwide ban on driftnet fishing, the COA will purchase driftnet fishing boats over 15 years old at 12,000 new Taiwan dollars per ton and will provide low-interest loans to fishermen with newer boats. The council is also considering helping local fishermen change to other professions.

## THAILAND

### 'People's Forum' To Challenge World Bank, IMF Development Policies

*BK2108045991 Bangkok BANGKOK POST in English  
21 Aug 91 p 3*

[Text] Thai nongovernmental organizations [NGOs] will organize a "people's forum" to challenge the policies and programs of the World Bank and the International Monetary Fund when the global organizations hold their annual meeting in Bangkok in October.

Thai communities feel it is extremely important to challenge the mainstream development policy during the meeting, the chairman of the Thai NGOs Coordinating Committee on Rural Development, Doctor Sane Chamrik, said yesterday.

The NGOs' meeting is aimed at telling the organizations directly that the "success" of development programmes financed by the World Bank, the IMF and other mainstream development institutions has never reached underprivileged people, Dr. Sane said.

A Thai working committee consisting of representatives from five prominent Thai NGOs was formed nine months ago to plan the forum. They are the Thai Volunteer Service, the Thai Development Support Committee, the Local Development Institute, the Project for Ecological Recovery and the Thai NGOs Coordinating Committee on Rural Development, which is a coalition of 220 organizations.

They met yesterday under the chairmanship of Dr. Sane to map out their strategies.

Thailand is often projected as a model of successful development strategies because of its recent economic growth surpassing 10 percent per annum in the last three years, Dr. Sane said. But behind such economic success lies a record of widespread suffering, economic degradation, economic injustice, human rights violations and

social conflicts which raise forcefully the question of how many people are actually benefiting from the economic boom.

The Thai NGOs cited the plight of 10 million forest-dwellers who are considered trespassers by the Government and are being forced to leave their land as a result of a national forest policy to promote commercial reforestation.

The coastal ecosystem is being destroyed and fishing families are losing their livelihood because of shrimp farming which is ruining mangrove forests.

Rice farmers in the Northeast are losing their livelihood because of a dramatic increase in rocksalt mining for the petrochemical industry.

The Thai NGOs also said slum dwellers are in a crisis, facing eviction as a result of increased urbanisation and land speculation.

"We hope to challenge prevailing development strategies in Thailand and around the world and to present alternatives," Dr. Sane said.

The forum will consist of a three-day meeting of Thais and a six-day international session.

These will be held at Chulalongkorn University from October 8 to 18. The World Bank-IMF meeting takes place on October 15 to 17.

The Thai meeting will be attended by 500 representatives of various organizations. About 140 people from around the world are expected for the international session.

The NGOs' forum will focus on the presentation of case studies on forestry, industrialization and urbanization.

### World Bank Defers Decision on Loan for Controversial Pak Mun Dam

*BK1109024191 Bangkok THE NATION in English  
11 Sep 91 p 3*

[Text] The World Bank has indefinitely postponed a decision on a loan for the Pak Mun dam, and may not further consider the controversial hydro project until after the Bank's annual general meeting in Bangkok next month, a source in Washington told THE NATION yesterday.

The source said the Electricity Generating Authority of Thailand (Egat)'s Third System Development Project, which includes Pak Mun in Ubon Ratchathani province and the expansion of lignite mining in Mae Moh, Lampang province, were removed from the agenda of Tuesday's World Bank board meeting.

The stated reason for the delay was to give executive directors time to review new documents and to receive written answers to questions they posed during a special briefing session on Pak Mun in Washington last week.

A recent study by the U.S. Agency for International Development (USAID), ordered by the U.S. Congress, proposed that the United States not support Pak Mun because the environmental impact studies were "out-of-date, flawed and inadequate".

Meanwhile, the World Bank executive director (representative) for Thailand has allegedly threatened that the country will not borrow money from the Bank in the future if the Pak Mun loan does not come through, according to another source.

An August 15 letter from Minister of Finance Suthi Singhsane addressed to World Bank President Barber Conable reaffirms the Thai government's determination to go ahead with the project. (The current Bank president is Lewis Preston.)

"Because Egat needs the proceeds of the loan to pay project costs on time, I should like to request that your staff present the loan to the board on schedule.

"Rumours to the effect that my government is reconsidering the Pak Mun Dam Project are completely unfounded, and are based on erroneous interpretations of the functions of the (review) committee," Suthi stated in the letter.

In Bangkok about 150 opponents of the Pak Mun dam continued to rally outside the World Bank office at the Olympia building on Rama IV Road yesterday to demand that the bank decide against funding the project.

Representatives of the group yesterday delivered another letter to local World Bank representatives calling for attention to the possible health and ecological hazards that would be caused by the dam.

The protesters, including students, environmentalists and villagers from Ubon Ratchathani province, began rallying against the planned dam outside the World Bank's Bangkok office on Monday and spent the night sleeping on the sidewalks around the building.

Twenty-two students volunteered to stage a hunger strike as part of the protest and two more students from Khon Kaen University and the Nakhon Ratchasima Teachers Training College yesterday joined the fast.

The dam opponents on Monday submitted a protest letter to World Bank representatives, expressing concern over the dam project's imminent displacement of thousands of villagers.

Commenting on the anti-dam protest, Prime Minister Anan Panyarachun yesterday said the opponents have the right to express their objection to the Pak Mun project.

The premier said that as far as he has learned, the dam would not cause "too much" environmental damage.

## VIETNAM

### Nation's Urgent Environmental Problems Viewed

91WN0567A Hanoi NHAN DAN in Vietnamese  
5 Jun 91 p 1

[Editorial: "Protect the Environment for the Sake of Lasting Development"]

[Text] During the past 19 years, since the International Environmental Conference held by the United Nations at Stockholm, Sweden, environmental protection has become a task of strategic significance for all of progressive mankind in protecting the earth, which is in danger of regression and destruction because of the unconscionable acts of man himself.

Since then, environmental protection activities have been promoted in many countries and there has been coordination within the framework of the activities of the United Nations Environmental Program. However, mankind has not yet ended the increasingly greater peril of environmental regression resulting from the consequences of wars, the careless and excessive exploitation and use of natural resources, industrial waste, and the abuses of chemicals in agriculture, which pollute water and the atmosphere. That situation has caused an imbalance in the ecological system and has caused many natural disasters and other calamities.

Our country is still at a low level of development, its population is increasing rapidly, and it is suffering the long-range consequences of many wars. The environmental situation poses many urgent problems which must receive special attention. During the past 40 years our country has lost about 50 percent of its forest land because of chemical poisons and haphazard exploitation. At present, only 20 percent of the country's forest canopy-covered land remains, and that area is continually being reduced. The area afforested every year does not keep pace with the forest that is cut down or burned. The loss of forest land has resulted in the loss of fertile top soil (due to erosion) and the loss of water reserves under the forest canopy, which causes the drying up of water sources during the season and floods during the rainy season.

The haphazard exploitation of forests resources and marine products have rapidly depleted the once rich plant and animal gene pools in our country. Mineral resources also have not been exploited and used rationally, which causes waste and adversely affects the environment.

Many industrial zones, factories, and enterprises do not yet pay adequate attention to ensuring industrial sanitation and waste processing to protect the health of workers and fight environmental pollution.

The long-range development strategies of all nations cannot but take into consideration the overall measures for rationally using natural resources and protecting the

environment. Our country has stepped up its development and is in the process of completing a national action plan regarding the environment. The Political Bureau resolution on science and technology in the renovation pointed out that it is necessary to "Renovate and raise the level of technology and management organization, exploit to the maximum the existing production capabilities, protect natural resources, and protect the environment."

An urgent problem at present is to have overall measures intended to rapidly reduce the rate of population increase, to manage forest resources and the other natural resources effectively, and to expand the afforestation movement everywhere, especially in the key areas (watersheds, reforested bare hillsides, and forest land submerged under salt water). It is necessary to stop the excessive exploitation of coastal biological resources, protect the diverse ecological system, and study the extensive application of technology to save raw materials, materials, and energy, and technology that produces little or no waste products.

No one has the right to fool around with the lives of others or their own lives. Therefore, no one has the right to engage in activities that harm the environment around them. In order to attain the goals of protecting natural resources and protecting the environment, in addition to

strengthening education and training and raising consciousness, it is necessary to perfect the system of management organization and laws regarding the environment.

#### **Headwater Forest Protection Intensified**

*BK0309082691 Hanoi VNA in English 0624 GMT  
3 Sep 91*

[Text] Hanoi, Sept 3 (VNA)—Plans have been worked out for the protection of forests that ring the reservoir of the Da Nhim hydroelectric power plant in the Central Highlands province of Lam Dong.

Irresponsible logging by both locals and state-run enterprises in the past 10 years has deprived the area around Da Nhim, the second biggest power plant in South Vietnam, of 19,430 out of a total of 73,800 hectares of forest.

To remedy the situation provincial authorities have completely replanted 200 ha, mainly with eucalyptus and acacia and replenished 100 more hectares. Six checkpoints have also been set up to stop poaching.

The Ministry of Forestry, for its part has invested 300 million dong so far this year in afforestation effort in the immediate neighbourhood of Da Nhim.

## CZECHOSLOVAKIA

### Measures for Scrapping Jaslovske Bohunice Nuclear Plant Underway

*AU2808073991 Bratislava SLOVENSKY DENNIK in Slovak 24 Aug 91 p 2*

[("bon")-signed report: "They Are Preparing To Scrap the Nuclear Power Plant"]

[Text] One of the unique technical problems confronting Slovak power workers is taking the Jaslovske Bohunice A-1 nuclear power plant out of operation. This power plant was brought into operation in December 1972 with an output of 150 MW. It was taken out of operation in 1977 having produced 1,500 GW of electricity. Taking the plant out of operation and completely scrapping it represents a complicated series of technical and organizational problems whose solution is also extremely demanding from a financial point of view.

A report on "The Conditions and Plans for Scrapping VVERs" [water-moderated water-cooled power reactors] is being prepared for the CSFR and Slovak Governments to assist in creating conditions for the speedy and safe scrapping of this power plant without further ecological consequences and dangers. The material is being prepared by the Federal Economy Ministry, the Federal Environment Committee with the participation of the Slovak Environment Committee, and the Slovak Energy Enterprise.

As the report makes clear, speedy measures for removing the remaining spent fuel and for the safe disposal of all radioactive waste produced are being prepared.

### Minister Vavrousek Criticized for Stand on Gabcikovo Project

*AU0309104291 Bratislava SLOVENSKY DENNIK in Slovak 29 Aug 91 pp 1, 2*

[Jan Lacko report: "Minister Vavrousek Is Gambling at the Expense of Slovakia—Will Common Sense Prevail?"]

[Excerpt] Supporters of the demonstrators against the Gabcikovo water dam project, such as the World Wildlife Fund (Switzerland), Globe 2000 (Austria), The Euro-chain Civic Initiative, and other independent "environmentalists" have not learned the lesson from the fiasco during the Danube river floods but, on the contrary, are mobilizing their forces and preparing new provocations in the near future. They refuse to bear responsibility for their illegal activity on the Gabcikovo water project construction site and for the damage they caused to the construction. They should be criminally prosecuted for what they have caused by their barbaric behavior.

The majority of our citizens are questioning the behavior of Minister Vavrousek, chairman of the Federal Committee for the Environment, who, without preliminary consultation with the Slovak Government, came to support the demonstrators. Moreover, without hiding his negative opinion on this magnificent project and without a mandate from the Slovak Government, he is going on his own to the Hungarian Parliament to explain his alternative—an alternative which Slovakia finds unacceptable. He closes his ears to the fact that the Slovak Government—having available an in-depth analysis drawn up by six expert commissions, including an ecological commission, and having the Federal Government's endorsement for its course of action—decided that, if the Hungarian Government does not change its negative standpoint on the completion of the Gabcikovo project, the government will push for option "C" as a temporary solution. Minister Vavrousek does not have a mandate from either the Slovak or the Federal Government to hazardously push for his compromise solution, which differs from the original one. By doing this, he actually is willing to accept the fact that the Hungarian side will stop its work on the project and, consequently, withdraw from the still valid international agreement concluded in 1977. Apart from all the consequences ensuing from making the treaty null and void, this gamble at Slovakia's expense would mean that we would waive our right to present claims to the Hungarian government for compensation for damages and we would be jointly responsible for Hungary's debt to Austria. [passage omitted]

## POLAND

### Acid Emissions To Be Adjusted to EC Levels by 1997

*91AN0500X Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 4 Jul 91 p 1*

[Article: "Poland Wishes To Adapt Its Emission Standards to Western Level by 1997"]

[Text] The Polish Government wants to impose radical restrictions on the emission of acidic substances. As of 1997, Poland will put into effect emission standards that are commensurate with—and in some respects even stricter than—current regulations in Western Europe. This was declared by A. Pierzak of the Polish Ministry of Industry during his recent visit to the Netherlands.

As a result of the stricter standards, flue gas scrubbers will have to be built in many of the power stations. The power stations will also have to use more expensive types of coal with a lower sulfur content. Pierzak also said that his ministry wants to reduce the amount of coal-supplied power to about 50 percent of total energy requirements. At present, almost all of Polish industry operates on coal or brown coal. Part of the coal should be replaced with oil or gas.

Pierzak paid a visit to the Netherlands Energy Research Center (ECN), where 20 Polish energy managers have just completed a three-month training program. This course involved a few weeks of theoretical classes, followed by practical training sessions in power stations and in such organizations as the Dutch Quality Control Institute for Electrical Materials and Appliances (KEMA). The courses focused on modern coal technology, environmental impacts, and management structures in the energy sector. For the practical implementation of the theory, the Poles will have to rely primarily on their own initiative; since the energy sector was placed under the Ministry of Industry a few years ago, there is hardly any coordinated approach. The power stations are more or less free to determine their own policies.

#### Energopomiar

The Dutch training program is supposed to be continued in Poland. In autumn, a workshop on energy planning will be organized for energy experts from the Ministry of Industry. KEMA also has plans to cooperate with its Polish counterpart Energopomiar in the field of environmental technology and quality control. Within the scope of the construction of a flue gas desulfurization unit in the Belchatow power plant, KEMA will be entrusted with environmental measurements and quality control. In this power station an initial flue gas desulfurization unit will be built, with financial support from Dutch electricity producers. During the Belchatow works, KEMA is to train a number of Polish engineers, who will in due course carry out the environmental measurements themselves.

## REGIONAL AFFAIRS

### Brazil, Paraguay Sign Agriculture, Environment Pact

PY2708011891 *Brasilia Voz do Brasil Network in Portuguese* 2200 GMT 26 Aug 91

[Text] Presidents Fernando Collor and Andres Rodriguez have signed cooperation agreements in the agriculture and health fields and the preservation of the environment surrounding the Parana and Paraguay Rivers.

The ceremony during which the cooperation agreement between Paraguay and Brazil was signed only lasted 20 minutes. In the joint communique Presidents Collor and Rodriguez agree to step up bilateral technical cooperation in the agriculture and health sectors and the preservation of the environment surrounding the Parana and Paraguay Rivers that feed the Itaipu hydroelectric dam, the largest of its kind in the world.

In a speech made on the occasion, President Collor made it clear that the Itaipu hydroelectric dam is the best example of a sustained development. He also praised the way in which Brazilian foreign policy is being handled.

[Begin Collor recording] The Brazilian foreign policy, which is being conducted in a calm, balanced, and realistic way by Foreign Minister Francisco Rezek, has and will continue to be a permanent bridge for rapprochement with our Paraguayan brothers. As you leave Brazil, your excellency and dear friend Andres Rodriguez, president of the Republic of Paraguay, you can be certain that you have contributed to strengthening even more so the friendship shared by the Brazilian and Paraguayan peoples. [end recording]

President Collor will host a dinner party to fete his Paraguayan counterpart at 2030 at Itamaraty Palace. Andres Rodriguez ends his two-day visit to Brazil tomorrow afternoon when he will return to Asuncion.

## BRAZIL

### Foreign Minister Rezek Resigns as Head of Rio-92 Conference Task Force

PY2008212491 *Rio de Janeiro JORNAL DO BRASIL in Portuguese* 19 Aug 91 p 3

[Text] Brasilia—Foreign Minister Francisco Rezek has asked President Fernando Collor to relieve him of his duties as chairman of the task force that is coordinating and preparing the UN-sponsored Eco-92 Conference on the Environment and Development, which will be held in Rio de Janeiro. Rezek's resignation came a week after President Collor confirmed his invitation to former Economy Minister Zelia Cardoso de Mello to represent the Brazilian Government before those countries that will be represented at the conference. Although Rezek will no longer be involved in the organizational part of

the conference, which is scheduled for June 1992, he continues to chair the Interministerial Commission (Cima), which is charged with formulating the political and ecological positions Brazil will take at the conference.

Rezek reported that the chairman position he has left will be taken by Carlos Garcia, the national administration secretary and executive secretary of Eco-92. According to Itamaraty sources, Rezek's resignation was provoked by two unrelated reasons. The first one rests with the task force's operational nature, which is responsible for setting up the conference's overall infrastructure. The domestic tasks involved in organizing the conference are not in keeping with Rezek's main duties as foreign minister; that is, to expand the government's foreign relations. The second reason was the invitation extended by Collor to Cardoso.

Cardoso's friends claim that Rezek does not want Cardoso to hold such a prestigious job, which has an international status and which will be based in New York. They add that Rezek wants to appoint a career diplomat to this post, even though he is aware that Cardoso's appointment is a political prerogative of the Republic's president. In remarks to JORNAL DO BRASIL, Rezek noted, however, that Cardoso has a great deal of support within the government and that she could rejoin the Federal Government at any moment. "Yet, her new job may not have anything to do with the economy or the ecology."

### Former Economy Minister Turns Down Rio-92 Conference Ambassador Post

PY0609010491 *Rio de Janeiro O GLOBO in Portuguese* 5 Sep 91 p 1

[Text] Zelia Cardoso de Mello, the former economy minister, has turned down the designation of ambassador to the Rio-92 [United Nations Conference on the Environment that will be held in Rio de Janeiro in 1992]. About one month ago, President Fernando Collor sounded out this possibility, but extended no actual invitation to the former minister who ended up yielding to pressure from Itamaraty. The Foreign Ministry position was outlined by Foreign Minister Fernando Rezek and Secretary of Environment Jose Lutzemberger, who said that Cardoso de Mello has no sensibility for the environment.

On 3 September in Brasilia, the former minister communicated her decision to President Collor. Zelia said she will cooperate with the conference through Brasil Institute [Instituto Brasil] but will not accept the post of ambassador.

**Uranium Company Workers Contaminated by Radioactive Material**

PY2008185491 Rio de Janeiro *O GLOBO* in Portuguese  
17 Aug 91 p 9

[Text] Varginha, Minas Gerais—Uranio do Brasil, a state-run company and a subsidiary of Brazilian Nuclear Industries [INB], yesterday confirmed that 39 of its employees have been contaminated by "Cake Two" ["Torta Dois"] radioactive material. Since 1985, the company has stored some of its 8,000 tons of Cake Two in plastic drums in an open yard at an industrial complex in Pocos de Caldas, in southern Minas Gerais.

The company has persistently denied that its employees have been contaminated. Now, despite admitting the existence of the problem—which occurred in March 1990—the company stresses that the contamination of its employees has always remained "below international standards that are normally considered acceptable."

"Cake Two" is a substance that contains thorium, monazite sand, and one percent uranium. According to technicians, the 8,000 tons that are stored in Pocos de Caldas is enough to produce 80 tons of yellow cake [preceding two words in English], a concentrated uranium substance that can be enriched for use as fuel in a nuclear power plant.

The reported irregular storing of "Cake Two" has caused a rebellious atmosphere in Pocos de Caldas. The town's municipal council is studying a request from the Jorge Duprat Figueiredo Labor Safety and Medicine Foundation (Fundacentro) to supervise conditions under which "Cake Two" is stored. Uranio do Brasil claims that the National Nuclear Energy Commission is aware of what is happening.

**Amazon Governors Agree on Environmental Safeguards for Region**

PY2008203291 Rio de Janeiro *O GLOBO* in Portuguese  
19 Aug 91 p 7

[Text] Brasilia—After the disagreement over two points of the Amazon Code proposed by Amazonas Governor Gilberto Mestrinho, the nine governors of the Amazon states finally reached a consensus regarding the region's environment. During a meeting in Belem with Justice Minister Jarbas Passarinho and Regional Development Secretary Egberto Baptista, the governors approved the document proposed by the Federal Government, which includes an economic development proposal for the region. According to the document, which was signed on 16 August, the Federal Government will be in charge of preserving the environment and it does not ban international cooperation in the Amazon region, unlike Mestrinho's proposal.

The agreement was possible thanks to the strategy used by Egberto Baptista. Within the framework established to obtain the support of the governors, Baptista met with Suframa [Authority of the Manaus Free Trade Zone] and

Sudam [Authority for Developing the Amazon Region] a few days before the meeting. The elimination of the import quota for the Manaus Free Trade Zone that greatly benefits Amazonas State was announced during the meeting with Suframa. During the meeting with Sudam, Baptista agreed to disburse 80 billion cruzeiros to the region, obtained from fiscal incentives of the Finam [Amazon Investments Fund] that were available at the Amazonia Bank.

One of Egberto Baptista's advisers stated: It is quite obvious that the announcement of these measures made the atmosphere of this meeting more positive. So much so, that the meeting, which was expected to be long, only lasted a little more than an hour and an agreement was reached.

The nine governors voiced their opposition to the internationalization of the Amazon but in favor of international aid to safeguard the development and preservation of the environment. The governors also voiced their support for the decision to keep the Federal Government in charge of preserving the environment.

**Aeronautics Minister on Internationalization of Amazon**

PY2608140491 Rio de Janeiro *JORNAL DO BRASIL* in Portuguese 23 Aug 91 p 11

[Text] Brasilia—Speaking to the Chamber of Deputies CPI [Commission for Congressional Investigation], which is investigating the internationalization of the Amazon, Aeronautics Minister Socrates Monteiro said that he does not doubt the economic interest of international groups in the Amazon region, which comprises 54 percent of the overall national territory. The minister said that it would be naive to discuss Indian affairs without first assessing the foreign interests in the mineral reserves in the areas occupied by Indian tribes. Socrates Monteiro told the CPI: "The Indians must have enough land but they should not have any rights on the subsoil, because this would imply discrimination against the other Brazilians."

The aeronautics minister's view of the foreign interest is based on the "exacerbated news" disseminated by the foreign media on Brazil's ecological situation. "For them, everything here is bad. The forests have been devastated and the rivers have been contaminated. This type of campaign is not made in good faith," he said. The minister agreed with the statement made by General Antonio Rocha Veneu, the Armed Forces chief of staff, that in case of an illegal intervention in the Amazon region, he would go to war. "The general is courageous and Brazilian society will go to war for the Amazon region," Monteiro said.

The minister condemned the theory of former U.S. Secretary of State Robert McNamara, that the armies of developing nations must be dissolved, arguing that security must be handled by multinational forces organized by the United Nations. "To reduce what? We almost do

not exist," the minister said. "We total 320,000 men and we can all fit in the Maracana soccer stadium." He said that the country's current challenge is the Amazonas and he condemned the extremist positions of national ecologists who use the environment as an ideological banner. "Those people claim to be spokesmen of the Indians. The truth is that they talk a lot about something they do not understand," he said.

Socrates Monteiro concluded, saying that if the Aeronautics Ministry had electronic control over the 10 main cities in the area, including Tefe in the Amazonas, and Porto Velho, the capital of Rondonia, 90 percent of illegal trafficking would have been under control.

### Inter-American Development Bank To Invest \$1 Billion Per Annum for Environment

*PY3008132491 Brasilia Voz do Brasil Network in Portuguese 2200 GMT 29 Aug 91*

[Text] Enrique Iglesias, president of the Inter-American Development Bank, IDB, has announced that the bank will make new investments in Brazil. Iglesias made the announcement today following a meeting with President Fernando Collor at Planalto Palace.

IDB President Enrique Iglesias announced after meeting with President Fernando Collor that the IDB will invest a minimum of \$1 billion per annum in Brazil. The money will be used for the preservation of the environment and to clean up Guanabara Bay and the Guaiba and Tiete Rivers, through science and technology projects, basic sanitation projects, and in road reconstruction. Enrique Iglesias said he came to Brazil to tell President Collor that the IDB has confidence in the current Brazilian economic policies.

So far this year the IDB has invested \$840 million in Brazil. Iglesias said the bank has released another \$7 million to begin the feasibility studies on the Bolivia-Brazil gas pipeline and the Paraguay-Parana Waterway.

### Government Implementing Vehicle Inspection Program To Reduce Pollution

*PY0509021291 Brasilia Voz do Brasil Network in Portuguese 2200 GMT 4 Sep 91*

[Text] The government is implementing a vehicle inspection and maintenance program. The program will not aim at imposing sanctions, but at guiding and educating the owners of vehicles that operate with improperly tuned motors—or outside technical specifications—and that increase fuel consumption, environmental pollution, and the risk of accidents.

By the end of the year, the federal government will control the 12 million vehicles that operate in Brazil. The measure's objective is to reduce the level of environmental pollution, especially in the larger urban centers.

(Roberto Alves Monteiro), chief of IBAMA's [Brazilian Institute for Environmental Affairs and Natural Renewable Resources] Department of Environmental Records and Licenses, said today in Belo Horizonte that vehicles will be controlled through a program to be jointly implemented by IBAMA and the national Fuel Department.

[Begin (Alves) recording] We are considering the implementation of a vehicle inspection and maintenance program. The objective of the program will be to raise the vehicle owners' consciousness on the need to perform the necessary maintenance operations on their vehicles, seeking to avoid pollution beyond the expected levels. This, however, does not mean that the owners of old vehicles will have to install electronic injection [words indistinct] because old cars cannot even [words indistinct]. [end recording]

(Alves) said the program will indicate vehicles that should be considered for scrap, because it will provide for the gradual withdrawal of vehicles from circulation.

He added that the government wants to supervise the annual issuance of license plates to cars, trying to convince car owners of the need to perform appropriate maintenance operations in specialized shops. This could reduce pollution and the number of accidents.

## PERU

### Ministry Forms Commission To Study 'El Nino'

*91SM0467Z Lima EXPRESO in Spanish  
6 Aug 91 p A6*

[Text] In view of the evidence of a repetition of the "El Nino" phenomenon in our country next summer, the Ministry of Fisheries decided to appoint a full-time commission responsible for making evaluations and recommending suitable measures to reduce the phenomenon's negative effects and take advantage of its benefits.

A Ministry of Fisheries resolution (published in EL PERUANO yesterday), points out that anomalies have been detected in the Central Pacific ocean-atmospheric system, which could indicate the proximity of a heat wave event during the coming summer of 1992.

This confirms the fears (previously cited in EXPRESO) of the future occurrence of the "El Nino" phenomenon in the country's northern section after 10 years. Although it will not be as disastrous as that of 1983, it will have greater force than had initially been thought.

This situation has prompted the formation of a multi-sectorial committee, which is in constant coordination with the international scientific community. It is monitoring the progress of these anomalies toward our coasts, in order to determine their presence, intensity, and duration.

Ministerial Resolution 261-91-PE specifies that the commission will be headed by the vice minister of fisheries,

and comprised of representatives of the Multisectorial Committee for the National Study of the El Nino Phenomenon (ENFEN), representing Imarpe [Ocean Institute of Peru]; as well as from PESEP [Peruvian Fishing Services Enterprise], CERPER [Public Enterprise for Fishing Certificates], Pescaperu [State Fishmeal and Fish Oil Production Agency], ITP [Peruvian Institute of Technology], and Fonrespe [expansion not given]. This commission will be required to submit its recommendations to the ministerial office.

### ST. LUCIA

#### More Assistance for Caribbean Environmental Health Institute Urged

*FL0209225891 Bridgetown CANA in English  
2146 GMT 2 Sep 91*

[Text] Castries, St. Lucia, Sept 2 (CANA)—St. Lucia on Monday urged greater assistance for the Castries-based Caribbean Environmental Health Institute (CEHI) as the region grapples with efforts to protect the environment. Health Minister Romanus Lansiquot, speaking at the opening of a one week course on sewage management, said he would be putting the case for increased CEHI

assistance at the meeting of Caribbean health ministers in Washington later this month.

Lansiquot gave no indication as to the extent of the assistance St. Lucia had in mind, but he added, "every encouragement and support must be given to this very vibrant and effective institution so.... We can come to grips with problems pertaining to the environment in the region." The CEHI which began operations here in 1981, is a Caribbean Community (Caricom) project with an annual budget of U.S. 1.2 million dollars.

The sewage management course being attended by delegates from throughout the region is sponsored jointly by CEHI, the Barbados-based Caribbean Development Bank (CDB), and the Pan American Health Organisation (PAHO). Lansiquot said waste management was an acute problem for the region in light of rapid population growth, urbanisation, heavy pollution of coastal waters, and the outbreak of cholera.

Recent research by CEHI has confirmed a need for urgent steps to be taken to improve the operational status of sewage plants in the region. The course is a follow-up to a two day workshop held here in June on the technology and policy implications of effluent guidelines and standards in the Caribbean.

## REGIONAL AFFAIRS

### Conference Probes Effects of Pollution in Mediterranean Basin

91WN0641A Beirut AL-SAFIR in Arabic 6 Jul 91 p 3

[Article: "A Conference on Pollution in the Area Surrounding the Mediterranean Sea; Our Garbage Is Being Dumped Into a Closed Basin; With the Exception of Lebanon, International Measures Are in Place"]

[Text] The College of Law in the Holy Spirit al-Kislik University in Jubayl organized a conference two days ago in conjunction with the University Center for Law in Mediterranean Countries, which is subordinate to the Federation of Universities in Mediterranean Countries. The conference dealt with "The Effect of Pollution in the Area Surrounding the Mediterranean Sea on Maritime Law."

The conference was attended by Jack Jokhadarian, minister of state for environmental affairs; Emile Ruhana Saqr, member of parliament; President Charles Hilu; David Tetham, the British ambassador to Lebanon; Dr. Hashim Haydar, the acting president of the University of Lebanon, representing the minister of education; Father Basil al-Hashim; Abbot Bulus Nu'man; representatives of the Italian Embassy, the French Embassy, and cultural organizations; and activists.

The opening address was delivered by Father Antoine Khalifah, dean of the College of Law. He stressed that "Today, nothing but vigilance and steadfast determination can put an end to the deterioration of the Mediterranean." He pointed out, "Stimulating a movement of pride and solidarity in the Mediterranean countries is our primary concern. We will start with Byblos in particular, and our aim is to protect this body of water and to save our sea."

Father Antoine Khalifah called attention to the fact that "Establishing a new world order requires that the rights of small nations as well as their freedom, security, and sovereignty be respected. These are decisive matters in every cooperative and participatory endeavor which is undertaken to save man and the environment in which he lives."

Father Louis al-Haj, president of al-Kislik University, said, "It is obvious that the sea has always served as a mirror for man. So what image is being reflected by this sea? That image is undoubtedly the one which man himself placed in that sea."

Father Louis al-Haj reminded the conferees of the peoples who used the Mediterranean. He reminded them of all the legends that grew around the sea and all the heroic poems that were written about it. He said, "I can now hear a voice rising from the depths of our sea asking us, 'You who have been lamenting about my condition, what have you done about my resources, my beauty, and the heritage I have preserved for you?'" Al-Haj called

upon the conferees "to do something useful in the name of the common heritage which deserves protection and in the name of the old-time piety which is worthy of respect. He asked them to do something to forestall augmenting the threat of pollution to the surrounding area and to people."

Minister Jokhadarian pointed out that the Mediterranean was becoming more polluted every day. He said this pollution had to be fought continuously and methodically to save the area surrounding the Mediterranean from gradual though certain death. This makes the participation of countries, institutes, and individuals who are involved in this matter a must. The success of pollution fighting efforts in the Mediterranean Sea and safeguarding that sea, which is the cradle of civilization, will require the preparation, publication, and application of specific laws and principles."

Minister Jokhadarian then added, "The more we neglect the matter, the more critical the situation becomes. Our present concern is not calling attention to annual budgets and conjectures about the possibility of protecting the sea and the coast, nor is our present concern making a list of existing proposals and theories. But if all the beaches are not polluted, [as published] the gravity of the situation and the threat posed by it are such that our fruitful cooperation is required so that difficult decisions can be made."

### The First Session

The first conference session, which was chaired by Minister Jokhadarian, got underway, and Dr. Qaysar Nasr, the former minister of the environment, delivered the first lecture which was entitled "The Truth About a Sound Environment." Dr. Nasr listed some figures which have to do with damage to the environment. The figures showed the tremendous damage which is happening to the environment worldwide. He said, "Economic growth, which was originally brought about to produce more riches for the largest possible number of people, has become barbaric. It has turned the environment into a garbage dump."

Dr. Nasr emphasized that saving the environment means saving man. "It is not our intention to save the environment for its own sake. We are rather saving the environment so we can save man. We want to guarantee man a suitable place where he can live and develop mentally and emotionally."

Dr. Nasr pointed out, "Lebanon has been distorted by the successive, tragic predicaments it faced. The fact that we are intent on demanding that the environment in Lebanon receive its due comes from our rejection of violence in all its forms. We are demanding that the environment in Lebanon receive its due because we are assuming the responsibility for young people, and it is our duty to teach them peace by respecting other creatures. To that end, we want the rights of the environment to become firmly established on a mandatory basis in the near future."

Afterwards, Dr. Angelo [Tursi], an Italian, delivered a lecture about "The Different Kinds of Pollution and Toxic Wastes in the Mediterranean." He pointed out in that lecture that "The Mediterranean is a large, enclosed body of water with very limited access to the Indian Ocean and the Atlantic Ocean. Hundreds of millions of people live in the areas surrounding the Mediterranean, and these people are developing gradually, particularly in the industrial area."

Dr. Tursi touched upon the different kinds of pollution which afflicted the Mediterranean, especially in the past 30 years. He talked about chemical and bacteriological wastes which come from the sewage system. He talked about their biological products, and he also talked about chemical substances which are produced by industry, by agricultural activity, and by doing household work.

Tursi said, "If we pursue only one, systematic methodology to examine the Mediterranean basin, we might be able to find a new key to regulate it so that human activities can coexist with the different life forms and the various natural elements in that body of water."

The final lecture was delivered by Dr. Joseph Karam, the director of the second branch of the College of Law, Political Science, and Management Science in the University of Lebanon. Dr. Karam's lecture was entitled "Standardizing Regulations Which Are Applied to the Waters of the Sea: Legal Protective Measures." Dr. Karam started his lecture by emphasizing that seas in general were vulnerable to pollution but that the Mediterranean Sea was more vulnerable to pollution than other bodies of water. He said that the sources of this pollution were varied, but that its main source was discharge from vessels: everything that is deliberately or inadvertently discharged by vessels (petroleum or chemical substances) or substances which are dumped into the sea as a result of disasters at sea. Dr. Karam listed some of the disasters which occurred at sea in a number of Mediterranean countries. The most recent such disaster occurred in Genoa, Italy in April 1991 when the vessel, *Hathen*, sank and polluted an area that extended 25 km along the shoreline.

Dr. Karam explained that "The direct or indirect leakage by man into the seas of substances whose effects are harmful to the living resources of the sea and to human health constitutes pollution."

Dr. Karam called attention to international laws and measures to protect the sea, and he affirmed, "There are several aspects to fighting pollution in the international arena and in the domestic one."

"The preventive aspect of fighting pollution would be based on requiring vessels to take precautionary measures and requiring tankers to clean their holds in special ports.

"The restraining aspect lies in the punitive penalties which national courts would impose on vessels that violate the law."

"Financial compensation would be paid for the damage which results from pollution."

Dr. Karam concluded his lecture by pointing out that "Lebanon is considered one of the countries threatened by pollution. However, the war which has been polluting Lebanon prevented the country from getting the new laws which would have been compatible with the modern laws which were drafted by other countries."

### The Second Session

The second session, which was chaired by Khatchig Babikian, the minister of justice, was held yesterday.

Italian Professor Gregory [Dimitriou] gave a lecture about the current environmental situation in the East Mediterranean. He reviewed the status of the Mediterranean Sea "where the slow speed of the flowing water affects the concentration of toxic chemicals. Areas of the Mediterranean where the waters are deep are subject to relatively slow change also because of obstacles in the sea which obstruct the flow of water from one basin to another. That is why the various areas of the Mediterranean have distinctive and somewhat different chemical, physical, and biological properties."

Dr. Mishal Tabit spoke after Professor Dimitriou about "Household Waste and Reclaiming the Lebanese Shore." He was followed by Dr. Raymond Farahat, director of Maritime and Land Transport, whose lecture was entitled: "Lebanese and International Laws Face to Face with the Pollution of the Sea."

### The Third Session

The third session of the conference was held in the afternoon, and it was chaired by Nadim Salim, the minister of public works. Mr. Salim said, "The area around us is languishing. Our waters and our air are contaminated, and our land is ailing. What is even more dangerous is that we are still courting danger and following our own selfish pursuits. We are still absorbed by our own desires and immediate interests, convinced that everything can be managed. Most people are going about their business as though there were no problems."

Mr. Salim added, "How can we force societies, especially ours, to know their limits? How can we force them to stop at the deadly precipice and walk away from it? This, in my opinion, is the goal of the conference which people ought to be interested in." He pointed out that man must yield to nature so he can master it, and he reminded the conferees that environmental awareness and education were necessary and important.

Professor Luigi [Embrosi] spoke after Mr. Salim about "The Effect of the Pollution in the Mediterranean Sea on Public Health." He affirmed that "It has become an accepted fact that the land certainly cannot assimilate all the changes for the worse which are brought about by human activity. Nor can the sea assimilate all these

changes either, especially since all the waste produced by normal human activity on land ends up in the sea."

Professor Embrosi went on to say that "Scientific circles did ascertain a long time ago that this grave danger existed. They started anticipating the possible consequences of man's private industrial activities and the consequences of his agricultural activities in particular. They started assessing the decisive effect these activities will have on man."

"A solution to this problem would be difficult because it would not be enough for one country to take actual precautionary remedies, as is the case with some pollutants which pollute the air. Quite the contrary, the countries which surround the Mediterranean must choose more appropriate solutions, and they must do so in a modern manner."

Professor Embrosi then reviewed some groups of pollutants, and he emphasized the grave damage which these pollutants can cause to fishing, to travel, and to man who consumes food which comes from fish.

Professor Embrosi's lecture was followed by another one by Dr. Biyar Safa entitled "International Responsibility and Correcting the Damage at Sea."

The second day of the conference came to an end with a lecture by Father Antoine Khalifah on "An Educational Plan for the Environment." Father Antoine emphasized that "Legal procedures to protect the environment and dictate respect for it seem inadequate regardless of how strict they may be. Furthermore, environmental education should be mandatory and its aim should be to create environmental awareness so that we can guarantee an understanding of the environment as well as control over the problems that are created in it."

#### **Islamic Concept of Environmental Pollution Explored**

*91WN0640A London AL-HAYAH in Arabic  
8 Jul 91 p 17*

[Article by Dr. Anis al-Abyad, professor of Islamic History at al-Shari'ah College for Islamic Studies in Tripoli, Lebanon: "Islam's View of Environmental Pollution: the Holy Koran Emphasizes the Importance of the Natural Environment and Demands Its Protection for Continuing Generations"]

[Text] The term "environment" is used by scientists to refer to the aggregate circumstances and outside conditions which affect the vital activities of creatures that live under those circumstances and conditions.

Because the environment is associated with man's living conditions, the subject of whether the environment is good or bad is vital for man's life on earth. After all, environmental factors and the natural resources in the environment affect man's life. They affect the development of man's life and the development of his social and

economic institutions. Light from the sun, air, water, soil, and minerals are the elements which man uses to live his life. He can develop his life by increasing his understanding of this environment.

An environment that has been contaminated or polluted is seen as the opposite of a wholesome environment. God Almighty said, "Evil has become rife on land and sea as a result of man's misdeeds" [Koran: 30:41]. This means that because of man's deeds, land has been stricken with drought and waters have become barren, that is, land in cities which are adjacent to rivers. The significance of this statement lies in the association it makes between protecting natural resources and the life of man who depends on these resources to live his life. Protecting these resources means using them properly and taking measures against wasting or depleting them when they are being used.

#### **Making Use of the Heavens and the Earth and What Lies in Between for Man's Benefit**

The Holy Koran stated that the heavens and the earth and what lies in between have been made serviceable to man. Therefore, these heavens, this earth, and what lies in between make up the stage on which man acts out his life. God Almighty said, "He has made what the heavens and the earth contain serviceable to you; all is from Him. Surely there are signs in this for thinking men" [Koran: 45:13]. This means that God created all this for your use. When God Almighty sets forth in detail the concept that is in this verse, He says: "He drives the ships which by His leave sail the ocean in your service. He has created rivers for your benefit, and the sun and the moon, which steadfastly pursue their courses. And He has subdued to you the night and the day" [Koran: 14: 32-33]. God Almighty also said, "It is He who has made the ocean serviceable to you so that you may eat of its fresh fish and bring up from it ornaments with which to adorn your persons" [Koran: 16:14].

#### **Other Implications for the Environment in Islam**

The Holy Koran called upon man to contemplate the creation of the heavens and the earth. God Almighty said, "Say: 'Behold what the heavens and the earth contain!'" [Koran: 10:101]. God also asked people to look for the secrets of what God created and to discover what lies behind traditional practices and laws so that beliefs can be reinforced and God's divine presence proclaimed as well as His ability to give His creation a fresh start whenever and however He wishes. God Almighty said, "Say: 'Roam the earth and see how Allah conceived creation. Then Allah will create the second creation. Allah has power over all things'" [Koran: 29:20]. God Almighty urged man to consider the destiny of people so he can find where perfection and shortcomings come from and what causes one and the other. Thus, if "roaming" the earth means interacting with the environment, with the universe, and with life, then traveling in time means going back to the nations of the past and finding out what happened to those who were truthful

and those who were not. In this regard God Almighty says, "Say: 'Roam the earth and see what was the fate of those that disbelieved their apostles.'" [Koran: 6:11].

#### **The Concept of the Environment in Islam and Contemporary Thought**

In Islam man's environment is the place and the time where man happens to live. It follows then that man has to interact with that time and that place where he finds himself living because the Islamic concept of the environment covers all areas of human activity. Furthermore, man is to be guided by ideas which antedate those set forth by generations that succeeded each other. Man is to be guided by those ideas because human thought varies from one generation to the next as the prevalent measures, thoughts, and values which were espoused by each generation changed. The notion that the heavens and the earth and what lies in between have been made serviceable to man as his spatial environment and the fact that man is urged to contemplate this environment and to manage it will lead him to discover the oneness of the Creator. It will lead him to recognize that protecting this spatial environment is a condition for living the life which Islam has brought to man.

The concept of the environment in objective thought differs from that in Islamic thought because objective thought excludes the temporal aspect of the environment from its consideration and limits its consideration of the environment to the spatial aspect. Objective thought of the environment concerns itself only with air and water, domestic or foreign. It is concerned with waste storage facilities, with clamor or noise, with tremors and nuclear energy, and with the arts of production or technology. The temporal aspect of the environment, on the other hand, applies itself to the conscious contemplation of the fate of past generations. Its aim is to avoid making the same mistakes that were made by these generations and to intensify efforts to overcome the weaknesses of the spirit and avoid overstepping one's bounds. Man's success in populating the earth and making it flourish should not induce him to act against God's wishes. The nations which did that in the past, and they were more powerful and more successful, were wiped out. They ceased to exist because they did not adhere to integrity and to God's commands, and they did not refrain from actions forbidden by God. In this regard God Almighty says, "Have they never journeyed through the land and seen what was the end of those who have gone before them? More numerous were they and far greater in prowess and in splendor; yet all their labors were of no use to them. When their apostles brought them veritable signs they proudly boasted of their own knowledge; but soon the scourge at which they scoffed encompassed them" [Koran: 40: 82-83]. "Evil was the end of the evil-doers, because they had denied the revelations of Allah and scoffed at them" [Koran: 30:10]. "Allah gives being to all His creatures, and in the end He will bring them back to life ..." [Koran: 10:4].

Some people may think that the environment is contaminated or polluted by nothing more than material factors, such as those which contaminate the atmosphere that surrounds the earth, or by chemicals which are emitted by factories as waste materials. However, the Holy Koran hints at other aspects of pollution which have a moral dimension. This moral dimension implies that political, social, and educational conditions are to be provided to encourage actions by those who can do what is appropriate to reclaim and revive the land. People who can look after a cultivated crop until the time comes for it to be harvested should be encouraged to do so. In this context pollution refers to actions which interfere with the suitability and productivity of the land.

It is on this basis that all conduct which discourages those who work the land and induces them to abandon it by making matters difficult for them, by treating them unjustly, or by denying owners of the land their due harvest is similar to conduct which pollutes the environment because its outcome is the same as that of material pollution. In this regard God Almighty says, "It is He who brings forth all manner of plants: creepers and upright trees, the palm and the olive, and pomegranates of every kind. Eat of these fruits when they ripen and give away what is due of them upon the harvest day. But do not be prodigal; Allah does not love the prodigal" [Koran: 6: 141].

God Almighty links giving away what is due of the fruits of the earth on harvest day, on the one hand, with not being wasteful of these fruits, which are the gift of the earth, on the other hand. The significance of this lies in the determination by the Almighty that social justice, cooperation between people, and the non-wasteful use of the gifts of the earth are conditions for a continuing supply of these gifts. In this regard the messenger of God, may God bless him and grant him salvation says, "Cause no damage to yourself or to others." Islamic law rejects the notion of man causing himself or others any damage. Since neglecting the land and allowing it to lie fallow by any means is tantamount to causing damage to oneself and to others, it is, consequently, seen as a sign of ingratitude for God's blessings and a failure on man's part to thank Him for those blessings. The messenger of God himself, may God bless him and grant him salvation determines that "A Muslim may not intimidate another Muslim" since intimidating others is the shortest way to bring human production to a standstill. It is, therefore, the shortest way to sow despair in people's hearts and to discourage them from productive activity.

#### **How Environmental Resources Are To Be Treated in Islam**

In Islam the treatment of environmental resources requires safeguarding them and keeping them suitable for satisfying the needs of all generations, regardless of the attitude of any generation on the issue of their existence or on Islam as a whole. When a Muslim handles these resources, he is not isolated from non-Muslims. Therefore, he is not to ignore their rights to

make use of God's blessings on earth. The reason for this is that sooner or later anything which man does to spoil the environment anywhere on earth will have an effect on other places on this earth. God has, therefore, honored the sons of Adam without consideration of their faith, for God said, "We have bestowed blessings on Adam's children and guided them by land and sea. We have provided them with good things and exalted them above many of Our creatures" [Koran: 17:70].

All human beings are recipients of this honor simply because they are human. Their religion is not a factor in conferring this honor upon them. This sense is confirmed by what God Almighty says: "Say: 'Who has forbidden you to wear the decent clothes or to eat the good things which Allah has bestowed upon His servants?' Say: 'These are for the enjoyment of the faithful in the life of this world, though shared by others; but they shall be theirs alone on the Day of Resurrection.' Thus We make plain Our revelations to men of understanding" [Koran: 7:32-34]. The essence of this verse lies in the determination made in the Holy Koran that this environment is one. The Koran calls upon Muslims to do what they can to safeguard it so that society as a whole can benefit from it. After all, the earth and the heavens and what lies in between have been made serviceable to man. Another reference to these resources in the Holy Koran is found when God Almighty says, "Do you not see how Allah has made all that the heavens and the earth contain serviceable to you and lavished on you both His visible and unseen favors? Yet some would argue about Allah without knowledge or guidance or illuminating scriptures" [Koran: 31:20]. God Almighty also said, "He has made what the heavens and the earth contain serviceable to you; all is from Him. Surely there are signs in this for thinking men" [Koran: 45:13]. In the first verse we are told that God made the heavens and the earth and all the visible and unseen blessings they contain serviceable to man. This means that God's preferences for His creatures may remain hidden from man even though man's presence in the heavens, on earth, and what lies in between is essential so that human life can continue. In the second verse, however, the indication that everything in the heavens and on earth was made serviceable to man is absolute, and no reference is made to the different visible or invisible blessings in the heavens and on earth.

#### Protecting Natural Resources in Islam

Islam did not limit itself to an enumeration of the many natural resources, such as land, water, plants, and animals, as sources of blessings. Nor did it stop at showing us the importance of these resources and the vital role they play. Instead, Islam went beyond that: it pointed out the need to protect these resources so they can continue to provide future generations with the security they provided previous ones. These resources must be handled in accordance with traditional practices and laws which were ordained by God to guarantee that these resources will last. God commanded us to look very closely at the temporal and the spatial environment. He

commanded us to try to discover these laws and traditional practices. That is why God Almighty said, "Say: 'Roam the earth and see how Allah conceived creation. Then Allah will create the second creation. Allah has power over all things'" [Koran 29:20]. The significance of this verse is that contemplating the creation and the birth of the universe; putting consideration of the heavens, the earth, and what lies in between above all other considerations; and then acting accordingly in a manner that does not put the safety of these resources in jeopardy would be tantamount to worshiping God because to do all that is to carry out His commands.

The essence of this point is that Islam aims at safeguarding people's interests and protecting their rights against any violation of those interests and rights, be they essential or less than essential. The protection of health and life, for example, is an essential interest. That is why God's commandments made distinctions between required duties, confirmed tradition, supererogatory actions, and other actions. It is self-evident that Islam rejects or calls upon Muslims to resist any damage inflicted on an individual or a group by contaminating or polluting the environment. That is why any law which is issued and enacted to achieve that same view is in reality a decision that combines this world with the next. The real problem which is plaguing Muslims is that the notion they have of what constitutes worshiping God is shrinking. They do not extend the notion of worshiping God to the scientific and social fields even though there are many verses in the Koran in which God Almighty does determine that this world and the next complement each other in this concept. God Almighty says in one of those verses, "Proclaim the portions of the Book that are revealed to you and be steadfast in prayer. Prayer fends away indecency and evil. But your foremost duty is to remember Allah. Allah has knowledge of all your actions" [Koran: 29:45].

In this regard the concept of indecent and evil deeds is not limited to what is overtly indecent and evil. That concept includes deeds of all kinds which are carried out by man to contaminate the earth. This means that there is an organic link between religion and the world. Without the world there can be no religion, and without religion the world will have nothing good to offer.

#### Center for Environment, Development of Arab Region, Europe Established

91WN0639A Damascus AL-THAWRAH in Arabic  
14 Jul 91 p 8

[Article by 'Ali Mahmud Jadid: "Last Minute Details Associated With Establishing Center in Cairo Finalized by Damascus Conference on the Environment and Development in the Arab Region and Europe; Center Which Is To Be Called CEDARE Will Put an End to Counter Effects of Development and Environment; Minister of Environment Tells AL-THAWRAH, 'Syria Was One of First Countries To Call for Establishment of

**CEDARE To Become the Greatest Scientific Environmental Center for the Arab Homeland and Europe"]**

[Text] The Conference on the Environment and Development in the Arab Region and in Europe was held in Damascus this month between 8 and 10 July. The end of that conference brings to an end the last episode in a series of consultations and deliberations about establishing a center for the environment and development in the Arab region and in Europe.

Many serious proposals on the new Center for the Environment and Development, which is to be established in Cairo, were set forth at that conference, and many discussions were held about its technical, scientific, and organizational aspects. The idea for establishing this center took shape in 1989 at the UN Development Program's regional office for Arab countries and Europe. The idea was subsequently investigated and refined at the ongoing development conference which was convened in Cairo by the regional office in March 1990. The idea for the center was also explored at an advisory meeting for high level experts that was held in New York in April 1990.

The proposal to establish the center was favorably received. All the Arab countries that were attending a semi-annual review meeting of the Arab countries' regional program, which was held in Damascus in October 1990, supported the proposal. Recently, the main office of the UN Development Program in New York approved \$5.5 million in aid for the purpose of establishing the Center for the Environment and Development, and the Egyptian government agreed to provide the land, the buildings, and the necessary research requirements for the center. In addition, the Egyptian government will make an annual contribution to the center of two million Egyptian pounds.

The justifications and the motives for establishing such a center stem from a pressing need to confront the unfavorable impact on the environment of different human activities. Human endeavor, in all its various forms, brought about a fundamental change in the world's climate and in its biological and chemical cycles. At the same time, large stores of harmful wastes have been piling up. All these factors will have a most significant effect on future generations. Despite the drawbacks and the disadvantages which beset the world as a result of its attempts to move the economy and development forward, the world failed to achieve the standard it was hoping to achieve. The developing world is still bearing the unbearable burden of poverty, indigence, and environmental degradation. In their struggle to survive many poor countries have been forced to abuse the natural resources that are available to them, even at the expense of future generations. Seven million hectares of productive farm land are lost every year due to the loss of top soil, and more than one million hectares of land are also lost due to the lack of methods to protect this land from salinity. Moreover, stripping away the soil diminishes the efficiency of dams and irrigation systems.

All these and other facts came together and provided the real incentive for the birth of the idea to establish a center for the environment and development in the Arab countries and Europe. The name that was chosen for this center is the acronym, CEDARE.

Thus, the proposals, discussions, and the series of consultations laid matters of great interest at CEDARE's doorstep. The first matter of great interest was the effort to make the best use of natural resources, particularly fresh water and soil, to achieve the highest productivity possible and to protect these resources at the same time. The second matter of great interest, which is putting tremendous pressure on developing countries and on their scarce resources, is the population explosion and the growing numbers of people migrating to urban areas. Energy policies and the issue of pollution in cities will be given priority by the center.

CEDARE's aim is to find better methods and technologies whose aim is to use long-term applied research to blend environmental, educational, and social objectives in the development process.

Another one of CEDARE's aims is to study the principles and the indicators for evaluating the impact that development plans have on the environment. CEDARE wants to study the methodology of taking environmental measurements that are related to development plans and to the management of ongoing development economies. Still another one of the center's aims is to mobilize regional research efforts by setting up a network linking the institutes in question in the Arab region to programs that are shared by European and international institutes. The center will also expand the data base on environmental conditions and natural resources. This data base is essential for formulating plans and making decisions. In addition, the center will use activities, which will be accessible to the public, to raise the standard of the public's knowledge of environmental subjects and natural resources management. CEDARE will use human development programs to assist in developing national resources that can uncover and propose alternative solutions to environmental problems. CEDARE will also try to establish alternative policies and solutions to ensure that development will continue and to guarantee that natural resources will be wisely managed. It will serve as an intermediary and act as liaison in supporting research activity in institutes and organizations engaged in the management of natural resources and the environment. In addition, CEDARE will strive to devote special attention to women's affairs because women in the region have the responsibility of providing the family's basic needs, including water, food, and fuel. Women are usually the first to be affected by the misuse of the environment. In general, women will benefit significantly from any improvement in environmental conditions. CEDARE will, of course, offer both men and women employment opportunities.

Dr. Muhammad 'Abdallah Nur, regional director for the UN Development Program for Arab countries and

Europe spoke in this connection and said, "It seems to me that five years after it is established, the center will be able to store, classify, analyze, and bring together a large amount of information on the environment, on natural resources, and on economic and social conditions in the area. The center will make this information accessible, and it will strive to publish results and to have them conveyed to a network of national and international terminals so they can be used in economic planning and decision making. The center will offer advice and guidance in evaluating projects to find out what effect they will have on the environment locally and regionally. It will have the ability to offer local authorities advice on modernizing and coordinating their environmental protection laws when new laws are being drafted. The center will make preparations for confronting disasters possible by making early warning systems available. It will provide financing for environmental protection projects of regional or semiregional importance, or it will make it easier to obtain such financing. Moreover, the principles and guidelines of the Development Program to Protect the Environment and the continuing growth in technical assistance will become the center's unshakable foundation for helping governments and project founders blend the implications of protecting the environment with investment decisions and economic policies."

At the present time, no organizations are actually undertaking the affairs or functions which will be undertaken by CEDARE. There are individual institutes and organizations in most countries that deal with one task or with one part of those tasks, but these institutes and organizations do not coordinate their efforts, not even within the borders of one country. Furthermore, their collective efforts have no more than a marginal effect on decisions that are made in the area of principal economies. Since these activities coincide with CEDARE's, the center will reinforce these institutes and organizations. It will coordinate its activities with theirs, and it will use these institutes and organizations to convey information and to conduct research and training activities. It follows then that the center will reinforce existing efforts instead of merely duplicating them.

At first, CEDARE's organizational chart will consist of three levels:

1. A board of trustees, which is supposed to include outstanding men and women with achievements in the area of development and the environment, will provide the center with guidance and instructions and will serve as its moving force to mobilize the necessary funding. This board will also serve as CEDARE's governing body since the center will be a legal entity, quite independent of any outside influence.

2. A technical advisory board to provide guidance for the center's operations. This board is to be made up of a chairman and a number of noted regional and international experts.

3. An executive committee, which is to meet every six months to follow up on the center's activities, is to help management coordinate specialized regional studies so that the center can implement them.

In general, the regional director of the UN program made it clear during the opening session of the conference that the aim of this meeting was to lay down the foundations for the center. These include the center's technical, scientific, and organizational aspects. Five working papers were drafted, and their authors will explain them to get the debate started and to encourage those who have proposals to come forward. These papers deal with:

- The management of fresh water resources
- Land resources and desertification problems
- Marine and coastal resources
- Urban affairs and settlement
- Industrialization that does not damage the environment

In addition, networking arrangements as well as the center's organizational chart and financial arrangements will have to be discussed.

These issues were in fact discussed at great length with a keen sense of earnestness and responsibility. The discussions took place after the author of a paper explained his paper to the conferees. The authors of these papers are Arab and foreign experts and scientists.

The conference thus truly established important foundations for CEDARE. To a large extent, it formulated the goals that are being sought in establishing the center, and it articulated the reasons which made its existence necessary. The conference made it clear that the need for this center is pressing, given the dangers to the environment and to development in the area that is under its jurisdiction.

Significant global issues like these were of great interest to Syria, of course, given the nature of its political and economic makeup. So it was natural that the conference came to be held in Damascus since the government of the Syrian Arab Republic, represented by the State Planning Organization and the Ministry of the Environment, cooperated with the UN Development Program. Syria played an important role in formulating some of these issues. Its delegation to the conference was involved in formulating these issues, and so was Mr. 'Abd-al-Hamid al-Munjid, Syria's minister of state for environmental affairs, who was unanimously elected conference chairman. In the course of his repeated eloquent contributions to the debates, Mr. al-Munjid spared no effort in making Syria's civilized image clear. He pointed out that Syria was extremely interested in development and environmental issues under the historic leadership of the fellow fighter Hafiz al-Asad.

We met with the minister of the environment on the occasion of the conference. The minister said, "It gives

us a great deal of pleasure that this Arab and international meeting is being held in Arab Damascus. It is being held in the revolution's and Hafiz al-Assad's Damascus to lay down the scientific and organizational foundations of the greatest scientific and environmental center for the Arab and European regions. This meeting dealt with the most important environmental problems which are plaguing the Arab homeland: the problem of water and proper water usage; the dangers to the future of food security which are posed by the soil being washed away; and the proper use of marine and coastal resources to serve the countries of the Mediterranean and safeguard marine resources and their survival. This conference also discussed the effects that industries which pollute have on continued development, and it discussed the need to devise an effective strategy in every respect, social as well as economic, to protect the resources and the environment of our Arab homeland."

The minister of the environment added, "Dr. Faruq al-Baz, an Arab scientist in the field of remote sensing, presented a lecture on the role of sensing in observing pollution on the surface of the Earth. He pointed out the immediate and distant dangers which resulted from the Gulf war, and he also pointed out the effects of this irresponsible action which was carried out by the ruler of Iraq against the Arab homeland and the world. Dr. al-Baz showed the major environmental damage to our present and future environment that was caused by the war. The conference also discussed the strategy of financing this center and how effective that center will be in dealing with problems of the environment in the Arab region and in Europe." Dr. Muhammad Nur shed some light on CEDARE's organizational, administrative and technical chart. All the Arab countries and most of the countries that participated in the conference supported Dr. Nur's candidacy to become the regional director of this center whose establishment in Cairo has been determined once and for all by the UN Development Program. "The Syrian Arab Republic," says the minister, "was one of the first Arab countries to call for the establishment of this center. Syria proposed that this center be established in Cairo because of the strategic role which the Arab Republic of Egypt is playing in the Arab region and in Europe with the cooperation of the Syrian Arab Republic."

The minister of the environment made it clear to us that this center, CEDARE, will be watching for environmental problems in the Arab region and in Europe and will be offering each country precise information about these problems. The center will also be offering the necessary expertise, technology, and assistance to remedy these problems. It will also be conducting training courses in the various fields of knowledge to protect the environment in all areas of the economy and ensure continuing development.

Our curiosity was piqued by what the minister of the environment had to say, so we wanted to talk about anything with that Arab scientist, Dr. Faruq al-Baz, from the United Arab Republic. We met Dr. al-Baz, and we

asked him what he thought was the importance of CEDARE. Dr. al-Baz said, "What is most important in my opinion is that this center will offer the noble service of providing information about the environmental effects which affect man, animals, and plants. The center will collect information, and it will interpret this information in a manner that will allow decision makers to make use of it. This is important because national centers do not investigate developments which take place in the region as a whole. That is why CEDARE will be able to study and to watch what is happening to the environment in the region as a whole. This includes the land mass and the changes which will be taking place on this land mass, and it includes the three seas in the region: the Mediterranean Sea, the Red Sea, and the Persian Gulf. CEDARE will also study and watch what is happening in the atmosphere. It will study the effect that dust or other particles have on life. Because centers like this one exist nowhere at the present time, building it in the Arab homeland will have a salutary effect on protecting the environment in this region."

#### And Finally

We have a date then for a comprehensive briefing on the status of the environment in the Arab region and Europe. This will involve conducting studies and analyses, formulating solutions, and assisting in the application of these solutions in the field. We have a date to tie together what for a long time have been the two loose ends of an equation, namely, development and the environment.

We all know that many development projects are now being carried out at the expense of the environment. We also know that in many cases the environment is protected at the cost of slowing down development. Today, however, CEDARE is confronting this difficult equation. It will pursue vital development projects and, at the same time, it will preserve a clean environment. For CEDARE development and the environment can proceed on two parallel courses. They will not countervail each other again, and neither one will grow at the expense of the other.

As we all wait, all we can do now is be greatly optimistic. But we will not become overly optimistic. We know in advance that, under the best of circumstances, years and years will be required to realize these hopes. And yet, the journey of 1,000 kms starts with one step. And the journey has started.

#### Potential Hot Spots for Future Conflicts Over Water Examined

91WN0679A Tel Aviv BAMAHA in Hebrew  
24 Jul 91 pp 24-27

[Article by Hayim A. Raviv]

[Text] Within 10 to 15 years, the water situation in the Middle East will become the main focus of violent conflict: as countries in the region run dry, the battle over water becomes inevitable. That is the general

opinion among many experts both within the region and outside. It is also the conclusion reached by studies conducted in the past two years. They foresee a conflagration likely to break out in one or more of the region's three principal water systems: the Nile system, which serves Egypt, Sudan and Ethiopia; the Euphrates-Hidqal [Tigris] system, which serves Turkey, Syria and Iraq; and the Jordan-Yarmukh system, in which Jordan, Syria, and Israel have a stake. The risks of war over water are ranked in this order: the "hottest" area is the Euphrates basin, followed by the Jordan basin and finally the Nile basin.

Indeed, more than one of these areas has stood on the threshold of war fought over water problems. In 1974, when it seemed to Egyptian President Anwar Sadat that Mengistu, Ethiopia's Marxist ruler, was planning to divert the sources of the Nile with Soviet assistance, he threatened to dispatch air force planes to bomb Ethiopia. That same year, Syria and Iraq nearly came to blows for similar reasons. Syria had built a number of dams on the Euphrates River, which caused a large reduction in the flow of the river into Iraqi territory. Iraq concentrated military forces along the border and threatened to shell the "Al-Tura" dam in Syria. Only the intervention of Arab mediators persuaded Syria to increase the allocation of water flowing into Iraq. The Iraqi threat was defused. For years, water disputes have burdened Syria's relations with Iraq on one border and with Turkey on another. Tensions have often risen to the breaking point. On the eve of the Gulf war, Saddam Husayn accused Turkey of violating international water laws. In an interview King Husayn granted "The Independent" two years ago, he declared that he would not hesitate to go to war over water.

Israel's relations with the confrontation states have also included an element of friction, sometimes open and sometimes covert, regarding water sources. The American international expert in water matters, Joyce Starr, argues in a recently published study that the region's water is dwindling away and the water time bomb is ticking away; the explosion is a question only of time. Investigators at the Geographical Institute in Tel Aviv, however, have a different view. They contend that the region's problem is not a lack of water but only of the readiness of the area's countries to engage in cooperative action. Haifa University Professor Arnon Sofer believes that water disputes will serve as a pretext for war in the coming years if these countries do not take positive steps towards peace and order. A hard, punishing drought lasting a year or two in the Euphrates or the Jordan will accelerate this process. "In that case, we will find ourselves forced to fight for drinking water," he says. Various Arab experts also have concluded that the decade of the 90's will be characterized by struggles over the Middle East's limited water sources. "We must expect," they say, "that Israel will want to commandeer additional supplies of water for settling the huge wave of Soviet immigrants. That could sharpen the struggle into actual war."

A number of factors have come together to create the potential for conflicts over water in the region: the geographic structure of primary water arteries—the fact that many water sources are shared by a number of states that are not inclined to distribute them in a fair and balanced way; the fact that supplies of water are inadequate to the needs of all the countries of the region, given agricultural developments and rapid demographic growth; declining rainfall; the failure to discover new sources of water; inefficient maintenance and bungled management of water installations; and finally, outright waste. It is clear that between 50 percent and 60 percent of all water in the irrigation systems in Egypt, for example, is lost because of drainage problems and evaporation. The same phenomenon exists on the lower Euphrates.

The dispute over the waters of the Euphrates among Iraq, Syria, and Turkey is not new but has worsened recently, chiefly because of the progress made in Turkish projects for developing south-east Anatolia. Turkish dams under construction in that area are stealing vast volumes of water from her two neighbors. The central project, the Ataturk Dam completed a year ago, adds a new dimension to the dispute, especially in Turkish-Syrian relations. This dam, considered the ninth of this type in the world, is located 60 km from the Syrian border. It took five years to build at a cost of one billion dollars and rises to a height of 170 meters. In Turkey, it is regarded as a prestigious and beneficial project for developing the nation's energy system. Experts expect that the extensive lands to be watered with the aid of the dam will enable Turkey to become a regional agricultural power or the granary of the Middle East. The Ataturk dam is the ninth built on the Euphrates River, and experts estimate that it will fundamentally affect water supplies available to Syria and Iraq. By the year 2005, the Turks plan to build another 21 small dams on which 17 electric power plants will be constructed.

Syria and Iraq view the construction of these dams as a grave threat to their own water systems. In January 1990, Turkey cut off the flow of water in the Euphrates from Syria and Iraq to fill the reservoir behind the Ataturk Dam. For Syria, which relies on rainfall for its agriculture, the cutoff occurred during a crippling drought. Talks conducted by the three countries with an eye to fashioning a uniform water policy did not lead to concrete results. Syria and Iraq, bitter political enemies, found themselves allied against a common adversary, Turkey. They are not prepared to surrender what they call their legitimate water rights. Consequently, observers believe the possibility cannot be excluded that the two are ready to do battle to assure those rights. It is worth remembering that the Iran-Iraq war broke out over a dispute about the boundary of the Shat-al-Arab district, which is considered the richest source of fresh water in the Gulf region.

According to reports in the Iraqi media, Turkish irrigation installations are liable to impinge on 5.5 million Iraqis who live in the Euphrates basin. Some 4 percent of

all agricultural land in the basin will be taken out of use. Five power generators, supplying 40 percent of Iraq's electrical needs, will be idled, while 13 million dunams of rice growing fields—about 40 percent of the country's potential—will become worthless. These reports are greatly exaggerated, for Iraq has another source of water, the Hidqal, a robust river capable of mitigating possible damage. In fact, Iraqi authorities have already begun transferring water from the Hidqal to the Euphrates north of Baghdad. "Iraq and Turkey," says Professor Sofer, "have common interests most clearly in oil matters. Turkey will find it very difficult to squeeze Iraq dry. My guess is that they will come to some compromise allowing Iraq reasonable use of the waters of the Euphrates." Thus, Iraq's water situation is not critical, but that fact does not prevent the Iraqi regime from demanding that Turkey increase its allocation of water from the Euphrates or, on the home front, from exhorting people to use less water. A year ago, Saddam Husayn informed his nation: "From now on, we must know how to use less of the water we derive from the Euphrates. The water shortage is expected to last for years." At the same time, the Iraqi ministry of agriculture, in light of the forecast for an extended shortage, has renewed its consideration of plans for reclaiming agricultural land.

The implications for Syria are very serious and complex. Unlike Iraq, Syria has no alternative to the Euphrates. The Syrians hold great hopes for a dam of their own on the Euphrates. They believe that the dam will meet both residential and industrial electrical needs. They laid some large pipes for bringing water from the Euphrates to supply the needs of the town of Halab [Aleppo] 200 km away, but their hopes have faded in recent years, particularly since Turkey began to carry out its own irrigation and electrical plans. As a result, water levels dropped in the river and the Asad reservoir built behind the Euphrates dam. Lower flows of water from the Euphrates into Syria have caused a considerable cut in electrical output and were reflected in dried fields of cotton and sugar beets in lands amounting to hundreds of thousands of dunams. The severe shortage of water for farming and drinking was felt when 7 turbines out of the eight built at the dam ceased to operate.

Syria attributes political objectives as well as economic ones to the Turkish water facilities. She believes that the Turks are attempting to use water as a means of putting pressure on her to accede to Turkey's border demands and security claims. It is reasonable to suppose that political calculations are mingling with others here. For a long time, Turkey has demanded that Syria stop providing assistance to the Kurds and Armenians, bands of whom are murdering Turkish diplomats around the world.

In recent years, Syria has exhibited a high degree of awareness of water issues. She is trying to exploit every possible water source—the Euphrates, the A'atzi [Oronites] and the Yarmukh. Their main problem is distribution of water within the country. In August,

1986, construction of a new dam on the Euphrates, called the "Ba'ath," was completed. The Syrians are also planning to build a large dam up the Euphrates, named "Tashrin." These two dams will offer better drainage of the water flowing in from Turkey, both for irrigation and drinking purposes and for production of electricity. The Syrians are counting on that to support a host of planned development projects in the north of the country. Syria has large tracts of unwatered farm land. A quarter of Syria's population earns its living from farming and 17 percent of the national product is agricultural. Successive periods of drought since 1979 have dealt a body blow to the agricultural sector, which has prompted the Syrians to speed up the shift to a system of irrigation.

Water also has sharply divided Syria and Iraq. The Iraqis suspect that Syria is diverting more water than agreed. The waters of the Euphrates, which originate in Turkey, pass through Syria to Iraq but, the Iraqis claim, not in the proper volume.

Syrian plans for unilateral exploitation of the waters of the Yarmukh have at times struck considerable fear into the heart of the Jordanians, who have rushed to reach an agreement with Syria for joint use of the river's water. By the terms of the agreement signed by the two countries in September 1987, a dam is being erected near a power station 40 km from the city of Irbid in Syria. The dam, called the "Unity Dam," is supposed to store water for drinking and agricultural uses in Jordan. Construction of the dam might reduce the damage caused Jordan by pumping of water in the Syrian highlands but it cannot solve Jordan's water problem.

Jordan is beset by severe water problems. The city of Rabat-Aman suffers from a chronic shortage of water, which is doled out by the beaker there. Rabat-Aman has a million and a quarter inhabitants. Water, which is noticeably lacking, reaches its different neighborhoods only two or three times each week. Jordan has no sources of water and supplies of water brought in are meager. The main supplies come from flows from the mountain to the valley and waters inside Jordan. Agriculture's share of the gross national product is relatively low compared to other countries in the region, such as Syria and Egypt. Still, Jordan is making great efforts to muster other sources of water. For example, it has built facilities for purifying sewage water and is examining ways to desalinate water for drinking. Government officials are toying with the idea of a plan for laying water pipes from the Euphrates in Iraq to lands in the kingdom.

Now let us leap to the waters of the Nile. Observers are attempting to meet the threats presented by the expected rise in Egypt's population. But is that so? Nine African countries share the sources, tributaries and estuaries of the Nile. This fact is the source of political-security frictions between Egypt and her neighbors. From time to time, the nations of the Upper Nile talk with Egypt about allotments of water within the framework of the 1959 Egyptian-Sudanese agreement. Egypt argues that the treaty created a basis for allocating water, while the other

countries contend that changed conditions require negotiations for a new distribution of water. In the wake of the decline of water levels in the Nile in recent years, and the drought afflicting the nine nations, some of them have begun planning dams for the creation of water projects on the Nile River.

A certain fear of Sudan and Ethiopia grips the highest circles of the Egyptian Government. The Egyptian-Sudanese agreement sets forth that Egypt and Sudan will receive, respectively, 55.5 and 18.5 billion cubic meters. This division, which was acceptable at the time of signing, has become problematic today for two reasons: the dizzying rise in population and prolonged periods of drought that prevent division of water in these volumes between the two countries. Early in 1986, the two assented to the creation of an international committee that would study means for efficient exploitation of water under drought conditions. According to reports from Arab sources, Sudan plans to irrigate 6 million fadan by the end of the century. That would require an additional 15 billion cubic meters of water. No agreement exists between Egypt and Ethiopia concerning use of the river's waters, and the Ethiopians are unwilling to recognize the Egyptian-Sudanese protocol. The same sources report that Ethiopia also is carrying out irrigation projects along the Sudanese border (beyond the Ethiopian mountains) and is planning, with Israeli assistance, to build a series of small and middle sized dams of the sort Turkey has erected.

The quarrel over the Nile has raged among states whose balances of forces are not equal. The two largest countries situated on the river's sources—Ethiopia and Sudan—are militarily and politically weaker than Egypt; moreover, the two have no concrete projects at this time that they can put into effect. Consequently, Egypt has no particular cause for concern at the moment. Thus, it is reasonable to assume that Egypt has an interest in perpetuating the current instability in Ethiopia and Sudan, which makes it harder for them to realize their plans for diverting the sources of the Nile and allows Egypt to continue to draw the greatest share of the river's waters.

The primary danger from water problems threatening Egypt, however, arises from internal and not external causes. A United Nations report, prepared at the request of the Egyptian Government, has established that a decline in the volume of water entering Egypt, whether by possible diversion of the sources of the Nile or from any other cause, will create severe hardships in day to day needs for irrigation and electricity as well as for drinking. The report notes that Egypt relies on water as its sole source of energy for irrigation and electrical needs, a fact that restricts its ability to assure supplies of food and electricity to an ever larger population (Egypt's population grows by 1 million people every eight months, and more than 51 million people earn their living from farming). The water problem is also hindering realization of the government's policy of dispersing its population and visibly having an affect on

tourism. In 1988, for example, tour boats could not travel on the Nile because parts of it had dried up.

The average Egyptian now needs 2.75 cubic meters of water each day, but that "quota" is destined to shrink to just 2 cubic meters by the year 2000 as a result of the expected growth in population to 70 million people. To guarantee long-term supplies of water for irrigation and production of electricity, Egypt created Lake Nasser next to the Aswan Dam. Egypt relies on this reservoir for meeting its needs, estimated at 60 billion cubic meters per year, during dry periods. This lake, 500 kilometers wide and 10 kilometers long, saved Egypt during the years of drought that struck the nations of western Africa. Without it, scholars say, the Egyptians would have suffered a grave crisis verging on famine. In 1985, the Egyptians feared a severe shortage because of the drastic drop in water levels. Last year, after nine years of drought, Egypt enjoyed some good luck as levels finally rose. If not for that, Egypt would have been forced to scale back its agricultural acreage or abandon existing projects for expanding farm lands. That might have created internal pressures and political foment capable of upsetting the government's relative stability, or worse.

A testimony to Egypt's dependence on the Nile is the fact that it represents about 95 percent of her water for drinking and agriculture. It also supplies 25 percent of Egypt's electricity, generated by the turbines at the High Dam. In the past 25 years, the average level of the Nile has dropped to the minimum, primarily because of the extended drought in the Ethiopian highlands. In Egypt proper, calls increasingly are issued for a stricter water management authority to prevent agricultural and domestic waste. Similarly, there have been demands for a hike in water rates. The water problem in Cairo is doubly bad—both shortages and contamination. These problems derive mostly from a decrepit infrastructure and overcrowding. An effort has been made in recent years, with the aid of foreign assistance, to improve the infrastructure. The urban population undoubtedly suffers as a result, and it may be that many Egyptians are bathing less or not at all because of the water shortage, but the water problem holds its greatest implications for the agricultural sector. There is no awareness in Egypt of the need to conserve. Egyptians believe that water is a gift of nature and so find it difficult to understand why they must make wise use of the water they drink and drip on their crops.

All the countries of the region view water, exactly like land, as an existential problem on which there can be no compromise. Experts fear that if no way out can be found, talk will give way to tanks and cannons. Water without joy.

#### **Egyptian Study Cites Dangers of Arab Water Crisis**

*91AA0575Z London AL-SHARQ AL-AWSAT in Arabic  
28 Jul 91 p 5*

[Report from Cairo: "Arab Affairs Committee of Egyptian Parliament Warns Next War Will Be Over Water"]

[Text] The Arab Affairs Committee of Egypt's People's Assembly (parliament) emphasized in an important study of the Arab water crisis that the struggle for water is most intense in Africa and the Arab nations, that the water issue has become more fraught with danger than petroleum, that the nineties will be the decade of water, and that future wars in the Arab region will be over water.

The parliamentary study explained that Arab nations face a shortfall of 44 percent in supplying their water needs. Eight non-Arab countries control more than 85 percent of the sources of water resources in the Arab nation, not to mention Israel, which controls a large segment of those resources and hungers to usurp more water in order to support its huge influx of emigrants. Experts forecast that Israel will need an additional 800 million cubic meters of water annually by the year 2000. This may prompt it to wage a war in order to solve its water problems, especially since the 1967 war yielded Israel 500 million cubic meters of [West] Bank waters and 800 million cubic meters from the Lebanese rivers it seized by occupying the south of Lebanon.

The study added that the volume of water stolen by Israel from Arab water sources has risen to about 1,300 million cubic meters annually. Israel also constantly explores for subterranean water. One of its studies affirms that in the desert adjacent to the Egyptian-Israeli border, there is an underground water reservoir of great depth and with an estimated capacity of some 200 million cubic meters.

The Arab Affairs Committee of the Consultative Council revealed in studies of the water crisis in the Arab region that the 1967 War was significant water-wise, in that it enabled Israel to improve its water situation by occupying the Golan Heights and the West Bank, thereby making it impossible for the Arab countries to divert Jordan River tributaries. Cease-fire lines furthermore allowed Israel to control half the length of the Yarmuk River, whereas it only controlled a mere 10 kms prior to the war. This would make any Jordan River development impossible without Israeli consent.

As Arab projects came to a halt, the study added, Israel found a suitable opportunity to solve its water crisis at the expense of the Arab territories it occupied after the war. The Israelis diverted the Yarmuk in order to increase the flow into Lake Tiberius. Israel withdraws as much as 100 million cubic meters of Yarmuk water, according to Jordanian estimates.

The parliamentary study of the Arab water crisis also dealt with the struggle over the Euphrates River, calling upon both Iraq and Syria to quickly seek an empirical solution by entering into an international water-sharing agreement that would guarantee the future needs of both countries. Turkey's decision to stop Euphrates water from flowing into both Syria and Iraq for one month was described by the study as one link in the chain of struggle, and an action that openly and directly threatens

Syrian and Iraqi interests and poses a new threat to Arab national security as a whole. The report added that this problem requires Arab action on the national level to seek a fair and practical solution by approaching Turkey, which has strong ties with several Arab states, in order to reach agreement on the volume of Euphrates water it would be willing to pledge to Syria and Iraq.

The water study by the Arab Affairs Committee of the People's Assembly described international relations among countries of the Nile basin as relatively stable, and added that despite diligent effort to conserve and control water resources, Egypt has a constantly rising need for additional sources of water to serve needed land reclamation projects as well as an ever-growing population. It further added that Egypt has an essential role to play in Nile basin countries by creating interest in and awareness of the need for joint cooperation in developing Nile water sources.

The study emphasized that Egypt must explore for and develop alternatives to river water, and must pay attention to technological research in the fields of seawater desalination; the utilization of solar energy, which abounds in countries of the Middle East and Africa; and the possible use of seawater for irrigation. There is emerging world technology for the direct irrigation of strategic crops, such as wheat, with salt water or with treated sewage. The study also called on Egypt to increase its use of underground water, develop water resources, exploit and dam flood plains, optimize the utilization of rain water on the northern coast, and avoid losing river water to the sea.

## BAHRAIN

### Health Minister on Worsening Air Pollution Problem

JN2208201391 Manama WAKH in English 1550 GMT  
22 Aug 91

[Text] Manama, Aug 22 (GNA)—The level of dust particles contributing to air pollution in Bahrain has doubled in the last year, the Bahraini Minister of Health Jawad Salim al-'Urrayid said.

But he said there was no evidence of damage to public health.

Al-'Urrayid added that Bahrain was continuously monitoring the level of air and water pollution and its impact on health.

"The air pollution concentration, including the level of carbon monoxide, sulphur dioxide and other inhalable particles, is being measured on a daily and monthly basis, in association with various international agencies," said Mr. al-'Urrayid, who is also the chairman of the Environmental Protection Committee.

He said there had been an increase in the level of dust and soot, especially polycyclic aromatic hydrocarbon (PAH) since the outbreak of the Gulf war.

"The dust level recorded in May this year is almost double that of May last year, but it is still lower than that monitored in industrialized countries in Europe," said Mr. al-'Urrayid.

He said it was not yet proved that the increase in dust had led to an increase in certain illnesses, or a change in pattern of diseases.

Mr al-'Urrayid said many reports on the subject were exaggerated, and doctors who made claims that certain illnesses had increased had no statistical back-up to support their views.

"As usual there have been the usual summer diseases associated with dust, and it is advisable for people with upper respiratory infection, asthma and bronchitis, to stay indoors when there is dust wind or smoke said Mr. al-'Urrayid.

He said routine tests were also being conducted on water salinity, acidity, temperature and chemical concentration, to monitor marine pollution.

Mr. al-'Urrayid said samples of fish found dead off the Bahraini coast had been sent for bacteriological tests in a Swedish laboratory.

"There has been no abnormality found in the quality of water tested," said Mr. al-'Urrayid.

"Most of the fish available in the market are safe for consumption. However, it is advisable to check fish for any visible marks, before buying them."

Mr. al-'Urrayid said scientists said it was unlikely that bacterial or viral contamination from fish would be transferred to human beings.

Mr. al-'Urrayid said experts from the World Health Organization, Germany, United States, Saudi Arabia and various international agencies were visiting Bahrain regularly to assist efforts to fight pollution.

## BANGLADESH

### Greenhouse Effect on Nation Feared

91WD0917A Dhaka *THE NEW NATION* in English  
10 May 91 pp 1, 8

[Text] The dreaded Greenhouse effect supplemented by the consequences of recent Gulf war and burning of its oil wells may be taking its toll in Bangladesh which now faces the worst climatic battering, according to experts and researchers.

A number of experts working on the environmental issues facing the country would not dismiss this possibility in view of the fact that the behavior pattern of climate has become ominously unpredictable.

Preferring anonymity, a leading environmentalist said: "It may not be proved conclusively that the erratic behavior of the climate is due to the Greenhouse effect. But it appears certain that there is some relationship between the two."

He noted that the cyclone and other climatic disturbances known since time immemorial in Bangladesh was accurately predictable. But since the 80s, there has been less predictability of the climate in the areas. In 1990s, the visitation of cyclone, floods and other climatic aberrations were really baffling to the experts who tried to fit them into their known formula without much success.

Experts now feel that the country located in a difficult geomorphological area that helps spawn the cyclones may now be facing prospect of such climatic battering more frequently. In fact the number sharply rose in the 90s.

Experts point to the continued production of Greenhouse gases by the advanced countries, despite warnings from the experts, contributing to the generation of temperature in the climate. Western experts tried to shift the responsibility to the Third World countries by saying that the huge population explosion and unhygienic breeding of cattle also contribute to massive generation of methane gas, one of the main contributor of Greenhouse effect. Experts in Bangladesh and other Third World countries suggested that the methane emission by Third World countries was for survival but those by the advanced countries are luxury emission. They said that the burning oils of Kuwait have contributed to the increase of temperature of the environment by a degree which is substantial in the short term.

These are spawning ill-effect on the climate in the area comprising Bangladesh, they said.

They suggested that Bangladesh must go for massive afforestation. At the same time, the advanced countries should embark on in-depth study of the situation and should also help remove the causes of environmental deterioration which they are creating, the experts added.

### Prime Minister Stresses Need for Disaster Management, Environmental Programs

91WD0916A Dhaka *THE NEW NATION* in English  
7 Jun 91 p 3

[Excerpts] Prime Minister Begum Khaleda Zia Wednesday stressed that disaster management programme should be made an integral part of environment protection and development, reports BSS.

"Bangladesh along with other developed nations will continue to take firm steps to overcome the environment pollution," she told a seminar organised in connection with the observance of World Environment Day at Osmany Memorial Hall here.

Begum Zia said immediate steps have to be taken to build up a green belt in the coastal areas of the country.

"We have to take tree plantation programme as the most powerful weapon to protect ecological balance as well as development" she said.

She said we have to attach top priority to tree plantation in the rural areas, around the houses and on the road sides.

Begum Zia called upon the people to plant at least one tree each and nourish them so that the number of trees increase by 11 crore every year and a green Bangladesh emerges.

Organised jointly by the Department of Environment and the Department of Forest and National Conservation strategy of the Ministry of Environment and Forest, the seminar was chaired by Dr. Mohammad Abdur Rashid, Additional Secretary in-charge of the Ministry of Environment and Forest. [passage omitted]

The Prime Minister called for adopting short and long-term programmes by the personnel engaged in administration and planning to protect the environment involving the people of the country.

She said her government had taken some measures to protect and develop the environment. She stressed that pollution control programme in the industrial units have to be geared up and matters relating to environment have to be considered with due importance while setting up new industries.

Begum Zia called upon the owners of mills, factories and transport to personally look into the environmental aspect so that environment was not polluted.

The Prime Minister said the entire humanity has been threatened by the destruction of environment world over. She said due to Greenhouse effects and other reasons, the world has becoming warmer and as a result the low-lying coastal areas were unlikely to go under water. [sentence as received]

She said huge areas of the coastal belts of Bangladesh were likely to be inundated if water level in the sea rose by one meter due to the Greenhouse effect.

Begum Zia stressed the need for united and integrated efforts by all nations to protect the environment and welcome the UN efforts in this regard.

Begum Khaleda Zia said Bangladesh has to take steps to overcome the crisis created out of environment pollution along with other developed nations. "We have already ratified the Montreal protocol regarding environment," she said and hoped that Bangladesh would play an effective role in this regard in the various forums, including the United Nations, Group of 77 and SAARC [South Asian Association for Regional Cooperation].

She called upon the people to launch a great social movement irrespective of party affiliation to protect and develop environment through planting trees in a planned way and to nourish those.

The seminar was attended by the cabinet ministers, diplomats and high officials.

## EGYPT

### Drought, Pollution Threaten Major Lake

91WN0622C Cairo MISR AL-FATAH in Arabic  
1 Jul 91 p 4

[Article by Fatin al-Sha'bani: "Al-Manzilah Lake Transformed Into Giant Sewer"]

[Text] The government in Egypt is self-defeating. Look at the al-Manzilah Lake which has dried up from 750,000 feddans to a mere 216,000 feddans. It once accounted for half the fish produced by the interior lakes but the runoff of sewage, agricultural drainage, and industrial wastes have chased away the populations of gray mullet, [al-danis] and [al-hanan]. The only fish remaining is [al-shabbar] which is contaminated with close to 16 poisonous chemicals.

Here is the story of the killing of the al-Manzilah Lake, which was one of the most beautiful and pristine in the north.

Ahmad 'Abd-al-Razzaq, Port Said's director of environmental affairs, says that al-Manzilah Lake borders the five governorates of Port Said, al-Isma'iliyah, Dumyat, al-Daqahliyah, and al-Sharqiyyah. Its source of pollution is the Bahr al-Baqr drainage canal, which is 190 kms long and carries about one million cubic meters of untreated sewage from al-Jabal al-Asfar and Bilbays as well as raw waste from villages and small towns in al-Sharqiyyah and al-Daqahliyah, which lie along the catch basin for Bahr Hadus, Ramses, and al-Sarw drainage canals. The lake is used by the five bordering governorates to dump their sewage and industrial waste, including untreated sewage from Port Said and Dumyat. As a result, pollution has risen to horrible levels, killing off several species of edible fish. Decomposing organic matter has exhausted water oxygen, lowering fish immunity and rendering them prey to bacteria and parasites that can also infect humans, of course.

The director of environmental affairs emphasizes that the problem will persist until the five lake-bordering governorates act to clean up their agricultural, industrial, and human waste.

Pollution in the sea, however, is blamed on the more than 7,000 vessels that stop in the territorial waters of Port Said awaiting their turn to cross the Suez Canal. They frequently dump petroleum products and other wastes at sea where there is no surveillance.

Some vessels also get into accidents, such as happened when the Liberian vessel [Harbor Libre] listed in the Suez Canal and discharged 2,000 tons of crude oil that found its way to al-Manzilah Lake through the Straight of Ashtum al-Jamil and other inlets that connect the lake with the canal.

Engineer Amin Zayd admits that the Suez Canal Authority owns only one unit to collect oils and other contaminants that spill in the harbor daily due to periodic oil changes by ferries, barges, and power boats.

Engineer Fikri Hasanayn, director of fisheries for Port Said, describes the lake as the largest in the northern delta, despite urban incursion and constant draining, causing its area to shrink to 216,000 feddans from 750,000 feddans in 1900 [as published].

The lake is also considered a major fishing resource and used to account for 45 percent of the fish production of all interior waters.

Health Director Dr. Mustafa Khalaf says that his department is confronting this catastrophe by regularly sampling coastal waters, as well as fish, for weekly analysis by the Ministry of Health and Atomic Energy [as published] laboratories in Cairo. Dr. Mustafa warns of the dangers of pollution caused by 16 poisonous chemicals and organic matter capable of killing fish and threatening human life.

Pollution is deplored by fish farmers. Samir al-Sawwaf, manager of a fish farm at al-Rashwah, laments that pollution and blockages of the straits are releasing ammonia that is killing the fish and diminishing the annual productivity per feddan from 200 kg to 120 kg of fish from the mullet and [al-danis] families. He added that the fish farms, which occupy 17,000 feddans, are in danger of shutting down.

## INDIA

### New Environment Minister Discusses Future Policy

91WD1011A Madras *THE HINDU* in English  
29 Jun 91 p 4

[Text] New Delhi, 28 Jun—Seventeen major polluting industries may soon be brought under the direct supervision of the Central Pollution Control Board to ensure that they conform to the various regulations on pollution control. The Minister for Environment and Forests, Mr. Kamal Nath, is also thinking of introducing a voluntary disclosure scheme for industries to enable them to come forward and declare that they have been violating the pollution control laws and set for themselves a target for remedying the situation.

At his first press conference on Friday Mr. Kamal Nath promised new thrusts in environment, both at the national and international levels, to ensure that the Ministry gives up its confrontationist posture and adopts a cooperative attitude towards development.

#### Source of Pollution

He identified the following industries as the most polluting: cement, thermal power plants, iron and steel, fertilizers, oil refineries, zinc, copper and aluminium

smelters, pulp and paper, basic drugs, dyes, pesticides, tanneries, pharmaceuticals, sugar, and breweries.

"Environment is the Ministry of the future. If we do not build a thermal plant today, we can do it tomorrow, but in the field of environment tomorrow may be too late," he said. "I want to build strong bridges between environment and development. I want a new and vigorous thrust in the areas of planting trees which bear fruits, nuts, give fodder and are useful for manufacturing medicines and a new thrust for growing trees for timber and fuel," he said.

The Minister also promised dramatic improvement in afforestation. He would ask the State Governments not to look at forests as a source of revenue and create an 'environment brigade' of about 50 students and youth in every district to support, promote and report environmental issues. The Ministry could think in terms of giving the brigades a stipend.

He said he would reactivate the Ganga Action Plan, paying special attention to the area between Mathura and Brindavan. The main tributaries of the Ganga—the Yamuna, Gomti, Damodar and the Hindon—must be given special attention in his view.

Mr. Kamal Nath said that the recently held conference in Beijing had strongly put forward the views of the developing countries. He hoped that would set the agenda and tone of the international conference on climate change scheduled to be held in June next year in Brazil. Environment would be the key issue of this decade and the Brazil conference would perhaps be the most important international conference of the nineties, he added.

#### Western Lifestyle

Mr. Kamal Nath said that there was no doubt that the prosperity of the developed world was based on the use, misuse and abuse of the natural resources of the developing countries over several centuries and that this "historic debt must now be paid back with interest." He said that poverty was at the root of the environmental problem in the Third World, while the lifestyle of the West had put additional strain on environment.

The Beijing conference emphasised the need for adequate funds to tackle the major issues and the need for transfer of nonpolluting technologies on a non-commercial and preferential basis to the developing world. The timeframe for switchover to new technologies should also be flexible to allow the economies time to adapt to new regulations, he added.

#### UNI reports:

The Minister said that a Rs 280 crore World Bank loan was on the anvil to make industry more "environment friendly" in India by installation of pollution abatement equipment and effluent treatment plants.

The loan would be administered through financial institutions and it would be available to all types of industries, existing ones or newly coming up, big or small.

The loan was without any strings attached and equipment could be purchased from within the country, if available, or from anywhere in the world.

He said efforts were being made to work out a formula for sharing the cost of pollution abatement on a 50-50 basis between the States and the Centre.

### **Mandatory Environmental Audit for All Companies To Be Introduced**

*91WD1012A Bombay THE TIMES OF INDIA  
in English 6 Jul 91 p 7*

[Text] New Delhi, 5 Jul (The Times of India News Service)—In his second salvo on programmes and plans before his ministry, Mr. Kamal Nath, minister of state for environment and forests, announced a mandatory environmental audit report by all companies.

He has begun a dialogue with the department of company affairs that the reports be made compulsory for all companies along with the director's report and the finance audit report.

This will be a self-audit where they disclose the environment laws that they are violating or not violating. A list of such laws and regulations that each company will have to check out are being prepared. In the winter session of Parliament, Mr. Nath said the Companies Act will be amended so that the environment conservation audit is made compulsory. Both the law ministry and the department of company affairs seem to have concurred with the minister's proposal.

Simultaneously, industries are being asked to create posts of chief environment officers with a cell under each. Existing industries much possess such facilities and industries and factories will be given consent to operate only if they create the cells.

Mr. Nath indicated this was vital to create awareness about environmental problems which "cannot happen with legislation alone."

In what is distinctly a carrot and stick policy, he said awards would be instituted for industries which boost the economy of the country while ensuring that the environment is pollution-free.

The idea of awards for nonpolluting industries was first mooted by Mr. Nilamani Routray when he was the environment minister last year. As a matter of fact, Mr. Nath has picked up many of the programmes and projects envisaged by his predecessors.

This includes Mrs. Maneka Gandhi's environment court which will now be called an environment tribunal, with benches in metropolitan cities where there is a conglomeration of industries.

Similarly, the waste management council, proposed by the previous incumbent in the ministry, will now be remodified and known as waste control programme. "Pollution control is largely waste management. Now we are focusing on waste control," the minister said.

The amount of waste released is to be controlled so that the units can function economically. Both FICCI [Federation of Indian Chambers of Commerce and Industries] and the Confederation of Engineering Industries are to be involved in the waste control programme and priority will be given to hazardous substances.

Asked how the environment tribunal would be different from the environment court, Mr. Nath said the court was all-encompassing but the tribunal work would be limited to hazardous substances and payment of speedy compensation for those who had suffered because of unsafe industries. The ministry's note on the setting-up of the tribunal, which Mr. Nath hopes will take place next year is to be put before the cabinet.

When it was pointed out that there seemed to be a lot of continuity with work being done by the previous government, the minister jocularly remarked, "There is nothing wrong with continuity. I hope my successor continues with what I am initiating if the need arises."

What could, however, be termed as his own scheme is involving citizens groups (initially in four metropolitan places) to take care of the environment in their area. In Delhi, these groups are to be set up to look after the Okhla area which is fast developing as an industrial zone.

With the help of the HRD ministry, Mr. Nath was hopeful of incorporating environment and ecology studies in the school and college curricula. Though his idea seems to still be foggy, he would like children to plant trees and grow with them. Each tree planted could bear the name of the child.

Mr. Nath expressed concern at the fast pace at which forests are being diverted for setting up various projects. Between 1980 to 1989, 1.53 lakh hectares of forest land was diverted to nonforest use. Between January and December of last year alone, he said 1.38 lakh hectares had been diverted.

Further, though the projects are cleared on the condition that they will do compensatory afforestation, no state ensures that this was carried out. Both in forest diversion as well as nonimplementation of the afforestation condition, Madhya Pradesh heads the list. Mr. Nath will be writing to the chief ministers to seek their cooperation in preserving the forests.

On the review of the Narmada project, the minister said he would be meeting Baba Amte, consulting NGOs as well as technologists and the pro-dam lobby before taking a decision on the controversial big dam project which submerge large chunks of virgin forests in Madhya Pradesh.

**Survey Shows 'Severe' Pollution of Major Rivers in Orissa**

*91WN0676A Bombay THE TIMES OF INDIA  
in English 24 Jul 91 p 11*

[Text] Behrampur, 23 July—Almost all the major rivers in Orissa are being severely polluted due to the discharge of untreated domestic waste and industrial effluents, according to a recent survey. The worst-affected are Mahanadi, Brahmani, Budhabalang, Kathojori, Rushikulya and Vansadhara rivers and the pollution ratio was rising alarmingly.

According to the state science environment and technology department, the Mahanadi, which stretches from Cuttack to Sambalpur, had become the sole source of drinking water, particularly during the summer.

**Atomic Energy Department Scales Down Production Target**

*BK0409120991 Delhi PATRIOT in English  
27 Aug 91 p 2*

[Text] The Department of Atomic Energy has scaled down its target of producing 10,000 mw of power from the atom by 2000 AD, Dr. PK Iyengar, chairman of the Atomic Energy Commission (AEC), said on Monday [26 August], reports PTI.

Addressing a press conference at the international seminar on small and medium nuclear reactors here, Dr. Iyengar said it was scaled down because "inputs were not available at the proper time."

He said the department now expected to produce 9000 mw by 2001 AD. Of this, 2000 mw is expected to come from two 1000 mw reactors that the Soviet Union is to set up in Tamil Nadu.

Seven thousand mw of the revised 9000 mw goal will come from indigenous reactors, he said. The original Rs [rupees] 30,000 crore estimate for the 10,000 mw target has now been scaled down to Rs 16,000 crore.

Responding to questions about the possibility of the Soviet offer not coming about because of recent developments there, Dr. Iyengar said at present there is "no change," in the proposed programme.

He said Indian engineers are discussing design details with their Soviet counterparts and, if the project goes according to plan, the first 1000 mw will be set up in 1998-99.

Dr. Iyengar also said Egypt and Syria and some other countries have expressed interest in India's offer of setting up 5 mw research reactors in other countries.

Research reactors are very good for training of manpower in different aspects of nuclear technology covering safety, reliability and operations.

The AEC chairman said the new industrial policy could have a healthy effect on the local auxiliary supporting industry, leading to the rapid indigenisation of the nuclear component industry.

**SAUDI ARABIA**

**New Station To Monitor International Weather, Ozone Depletion**

*91P40414Z London AL-HAYAH in Arabic  
2 Aug 91 p 11*

[Report by Muhammad Jamal 'Atabi]

[Text] Jeddah—The Saudi Meteorological and Environmental Protection Agency [SMEPA], in the Ministry of Defense and Aviation, is building the most modern weather observation station in al-Sawda' District of Abha, in western Saudi Arabia. The station will cost \$2 million and is expected to be completed in 12 to 15 months. Dr. 'Abd-al-Barr al-Qayn, general manager of SMEPA, explained to AL-HAYAH that the location's choice, at an altitude of 2,900 meters, is aimed at avoiding dust and air pollution while monitoring carbon dioxide contained in the atmosphere.

Al-Qayn said: "The purpose of the station is to give an early warning about changes in the international weather and ozone level depletion." He also stated that the station will cover the Arab region in its entirety, parts of America, East Asia, and Africa. This is due to its location and the lack of similar stations in those areas.

Dr. al-Qayn stated that the station will coordinate its work with 12 international central stations and seven satellites for meteorological observations. Information will be gathered through a computer from 9,000 stations around the world. The World Meteorological Organization, together with such countries as the United States, the Soviet Union, and Japan, plan to gather incoming information from operational stations worldwide and analyze the results of thermal gas retention in the atmosphere and its effect on expected weather changes.

**Poll Reveals General Mistrust of Official Environmental Information**

91WN0646B Moscow *PRAVITELSTVENNYY VESTNIK* in Russian No 24, Jun 91 p 10

[Article by A. Dumnov, department chief, USSR Goskomstat [State Committee for Statistics] Administration of Social Statistics, and S. Shasnov, head of the Bureau of Sociological Research: "A Friend Told Me: Why Are Rumors Stronger Than Official Information?"]

[Text] **How do people perceive the ecological situation?** Negatively, of course, you say. That is justified, but... indefinite. But modern sociology strives for precision. That is why USSR Goskomstat last year polled slightly less than 100,000 citizens living in 850 cities and villages, including industrial centers with a high level of pollution and the degradation of the environment, and populated places with a relatively favorable ecological situation. The statistical data has been processed and today we present the survey results for the reader's attention.

Fewer than nine persons out of a hundred surveyed are satisfied with the state of the environment where they live. Every fifth person surveyed is partially satisfied, more than half are frankly dissatisfied, and the others are undecided.

The pollution of the atmospheric air with toxic gases and the contamination of the drinking water; the radiation situation; the accumulation of trash in populated places; the noise; the degradation of areas of vegetation in cities; and the condition of the adjacent forests and recreational areas are among the approximately 15 alarming factors that the questionnaire asked the person surveyed to evaluate. It turned out that the factors that are troubling people most of all are the first four factors listed—the water, the air, vegetation, and dirt.

Incidentally, the questionnaire also asked people to evaluate the dynamics of the ecological situation—is it becoming worse, is it improving, or is it at least remaining stable? Almost two-thirds of the city dwellers stated that the water and the air are becoming dirtier, and only less than two percent feel that the situation is improving.

Naturally, the question arises: is the population objectively evaluating the state of the environment? Yes, in most instances the opinion expressed by the respondents coincides with the information provided by the monitoring services. True, the researchers also sometimes noted a more rigid reaction on the part of the city dwellers when there was a relatively low degree of pollution of the atmospheric air with toxic gases, and, conversely, the public's underestimation of the ecological disasters. This is explainable, because it is by no means possible to detect all the pollutants on the basis of smell or taste, or visually—of course we can see smog, but there are also transparent but harmful emissions.

Something that is very alarming is the fact that the city dwellers' opinion concerning the ecological situation is formed basically from discussions with friends and acquaintances (for 85 percent of the respondents), and from the local press and radio and television broadcasts (80 percent). But only every fifth person is familiar with the special literature, and one-third of the respondents are interested in lectures and reports given by ecologists.

The leading role played by the mass media in forming ecological opinion requires the maximum amount of objectivity and the most careful verification of the data being reported, regardless of where it comes from. Unfortunately, this does not always occur. Here is an example. The KURANTY newspaper in April cited data to the effect that 450 million tons of toxic substances had accumulated on the territory of the capital. Inasmuch as the area of Moscow is almost a thousand square kms, it turns out that there would have to be practically half a ton of trash on every square meter. Actually, the amount of trash that has accumulated on the territory of Moscow is smaller by a factor of several hundreds of times. As people say in Odessa, those are two big differences—500 or five kgs. That also is a rather large amount, and, of course, it is necessary to clean up the capital, but why should you frighten people with unverified data?

It is obvious that the incompleteness and disconnectedness of the ecological data collected by the state agencies; the informational passivity; and the inability to present that data in an easily understood, popular manner are causing a considerable number of city dwellers to distrust the official sources. Eight people out of a hundred completely trust the official information concerning the state of the environment; 15 people partially trust it; and half of them do not trust it at all.

The negative evaluation of the information concerning the environment is very closely linked also with the opinion concerning the work of the ecological services and movements. The activities of the state environmental-protection agencies are approved by only four city dwellers out of a hundred, and those of the public ecological groups are approved by every tenth person.

In conclusion, here is one more telling result: fewer than 10 percent of the city dwellers are in favor of closely or completely reorganizing the polluting enterprises. Apparently the people have already felt personally the negative consequences of such measures—there are no medicines or many other things, enterprises are stopping because shipments are being disrupted. At the same time almost one-third of the city dwellers feel that the polluting enterprises should pay large fines, and the ecologically harmful projects should be moved outside the confines of populated places. More than half the respondents feel that the general line in protecting the environment is the introduction of technological schemes with no waste products, or small amounts of them, and the construction and improvement of the operation of the purification structures.

**Long-Term Union-Republic Program on Aral Sea Proposed**

*91WN0646A Moscow PRAVITELSTVENNYY VESTNIK in Russian No 24, Jun 91 p 10*

[Article by L. German: "The Aral Sea: Hopes and Doubts"]

[Text]

**Hopes...**

The fate of the sea that has died upsets not only the inhabitants of the Aral Sea area itself and of those republics whose economy depends directly upon the rates at which that very large ecological disaster will develop. The union government and the USSR State Commission for Emergency Situations are attempting, despite the very difficult economic situation, to fulfill the tasks defined by the parliament's decree, entitled "Urgent Measures for the Country's Ecological Improvement." Serious programs that are aimed at resolving the problems of the Aral Sea have been approved by the recent (19 May 1991) USSR Cabinet of Ministers decree No. 261.

The press has published a large number of plans for saving the Aral Sea and has conducted an open competition, but for the time being none of the proposed resolutions, as a whole, could be called the optimal one. It is precisely for that reason that the government has instructed a number of union departments, jointly with the governments of Uzbekistan, Kazakhstan, Kirghizia, Tajikistan, and Turkmenia, prior to 15 June, to develop a draft version of a concept for the preservation and gradual restoration of the sea, coordinating it with the conditions of the socioeconomic development of the republics. The USSR State Commission for Emergency Situations must, within a ten-day period, view the draft and prepare it for presentation to USSR Supreme Soviet. On the basis of the concept it is proposed to develop by September a long-term union-republic program for 1991-1995 and for the period until 2005 for the fundamental improvement of the socioeconomic and epidemiological-sanitation living conditions for the population of the Aral Sea area and for restoring the Aral Sea. The projects dealing with the Aral problem, including the scientific research, will be financed by uniting the funds in the republic budgets and the union budget.

This very large program will include such subprograms, for example, as "Feeding the Population of the Aral Sea Area" and "Children of the Aral Sea." A large amount of attention will be devoted to improving the medical-sanitation conditions and the socioeconomic and ecological situation in the Aral Sea area. One of the tasks is the precise determination of the boundaries of the ecological disaster zone. This study must be submitted by 20 June to the USSR State Commission for Emergency Situations. It can be considered one of the first steps in preparing the draft concerning the status of the zone and the law governing the social protection of the citizens

who have been subjected to the effect of the consequences of the ecological disaster in the Aral Sea region.

USSR Ministry of Economics and Forecasting has been instructed to approve the scheme for the comprehensive use and protection of the water and land resources of the Aral Sea drainage area until the year 2010, stipulating in it the guaranteed intake of water into the deltas of the Amudarya and Syrdarya Rivers and into the Aral Sea. It has been proposed to the governments of the Central Asian republics that they take additional steps to introduce water-saving technological schemes for cultivating and irrigating agricultural crops, to improve the structure of the sown areas, and to achieve the broad introduction of scientifically substantiated systems of vegetable husbandry. In a word, to increase the activity rate in the struggle against the inefficient expenditure of water when irrigating the land.

**...and Doubts**

The situation in the Aral Sea area, unfortunately, does not give anyone any special cause for optimism. This is also confirmed by statistics—in the first quarter only eight percent of the investments from the union budget have been used, and the plan for construction and installation has been fulfilled by only seven percent. There is a serious reason for this, but we shall discuss it somewhat later.

Funds from the union budget (900 million rubles for the current year) are at the disposal of the Aral consortium, the creation and operating principles of which have already been discussed by our newspaper. The Aral Sea area is called an ecological disaster zone, but, it would seem, it would be more accurate to speak about a region of socioecological disaster. The food ration here is 20-30 percent more meager than the average ration for the Central Asian republics as a whole. There is a shortage of hospitals, pharmacies, and kindergartens, there are unbelievable difficulties with drinking water, and a sewer system exists in only one out of every hundred populated places.

"That is why we consider projects in public health and the municipal economy to be first-priority ones," V. Alenin, chief of the USSR State Commission for Emergency Situations Department for Problems of the Aral Sea and the Aral Sea Area, says. "And sometimes, when you hear the speculative judgments concerning the region's disasters, you involuntarily ask yourself, 'If there are no hospitals or sewer systems, what does the fact that the sea is drying up have to do with it?' Yes, it would be possible to restore the level of the sea very simply—just drain all the reservoirs, changing the Amudarya and the Syrdarya to natural runoff. That would give you 40 cubic kms. It is a simple method, but it is absolutely unrealistic, since those reservoirs operate not so much for purposes of providing energy, as for purposes of irrigation. If they do not exist, life will wither on tremendous areas. The consortium is carrying out major land-reclamation operations, but its leadership simply

does not have the right to abandon the construction of projects for public health or the municipal economy.

But... in the outlying areas many people do not like how the consortium is using the funds from the state budget. We might note that they are funds that were allocated for a specific purpose. Here is only one fact, but a very telling one. People from Karakalpakia say, "We are supposed to build a pharmacy, but we don't have any construction plan yet. Give us the money and we will use it to build a trolleybus line." There is no doubt that there is also a need for transportation, but the money has been designated for another purpose. This is not the only incident, and that is why the Aral consortium and the specialists from USSR State Commission for Emergency Situations have been putting so many hopes on the union-republic program. That program will clearly define who is supposed to do what and what funds are to be invested. But this is no simple matter. It is possible, for example, in the lower reaches of a river to plan practically a Garden of Eden, but what good are those plans if the water that continues to come down from the upper reaches of the river is the same runoff that is saturated with salt and polluted by pesticides?

It is not accidental that V. Alenin considers the work to develop the concept and program to be a kind of rehearsal of the Union Treaty. There is no tension here—it is to save the Aral Sea, just as it is to save the country's economy. What is needed is to have the center and a number of republics take well-coordinated actions that are based on the consensus.

And now about investments. Nowadays there is little benefit from money if it is not materialized in resources. Unfortunately, the reorganizing of the supply structures has led to... the disorganizing of the work done by the Aral consortium.

"The material-technical supply of the projects in the Aral Sea area and the entire drainage area of the Aral Sea is in a critical situation," V. Alenin says. "The deadlines are expiring for accepting the documentation for providing components to the projects that are supposed to be built next year, but USSR Minresursov [Ministry of Resources] has not yet made any decision about the procedure for providing them with components. Previously USSR Gossnab's Soyuzglavstroykomplekt engaged in work involving these projects, but now, since March, the main administration has refused to provide components to projects in the Aral Sea area. The reason is that it is necessary to create an organization to provide components in the Aral consortium. This problem has been discussed several times with First Deputy Chairman V. Melashchenko. First Deputy Prime Minister V. Doguzhiyev issued unambiguous instructions, but...

### Finnish Study Appraises USSR Environmental Problems

91WN0642A Helsinki HELSINGIN SANOMAT  
in Finnish 28 Jul 91 p C 1

[Article by Minna Lammi: "West Must Help Pay for Soviet Environmental Investments"]

[Text] Professor Hedlund has made the first comprehensive appraisal of damages to the environment of the USSR.

The environmental problems faced by the USSR are so enormous that West Europe must begin footing the bill. If the West does not help now then it cannot avoid suffering the consequences of the continuously spreading ecological destruction in the USSR.

The man urging the West to take quick action is Stefan Hedlund, a professor at the Institute of East European Studies at the University of Uppsala.

"The USSR does not have money to invest in environmental projects," says Hedlund.

An immediate investment of 100 billion rubles is needed just to establish the means to control air pollution and an annual infusion of ten billion rubles will be required after that.

In this year's budget Finland took an unprecedented step by setting aside money for improving the state of the environment in East European countries, but then these funds were reduced already in the spring's supplementary budget.

A big part of the USSR has been badly polluted by old industrial plants.

A researcher at the Estonian Agricultural Academy, Veiko Kivi, says that Soviets have lived in such horrible conditions for so long they do not even know what pure air is like any more.

In more than 100 Soviet industrial cities air pollutants exceed acceptable levels tenfold. Less than one-third of wastewater is treated.

Last month Professor Hedlund presented the first comprehensive appraisal by a Westerner of the Soviet environment. He compiled his appraisal from reports by various researchers on different areas in the USSR.

He predicts that within ten years large parts of the USSR will be uninhabitable and that the people living in these parts will have to be evacuated.

### 'Problems Must Be Divided Into Smaller Parts'

Many of the environmental problems of the USSR could be solved with modern skills and technology. The necessary investments are, however, too big for the USSR, which is struggling financially even without them.

According to Hedlund the problems should be divided into smaller parts. The Nordic countries should work together to remodel the nickel smelters of the Kola Peninsula, clean up the wastewater of the Leningrad area as well as the other environmental in the Baltic countries and Poland.

The Germans have their hands full with the cleaning up of East Germany. These German efforts also help the Nordic countries. According to Hedlund's estimate about one-third of the sulfur emissions coming into Sweden come from what used to be East Germany.

According to German estimates cleaning up the East German environment to meet Western standards will cost more than a trillion markkaa over the next few decades.

The EC, for example, is not cohesive enough to take care of Soviet environmental problems.

"One would think that at least the Finns and Swedes would be interested in the Leningrad area," says Hedlund.

One-fifth of the Leningrad district's wastewater is piped untreated directly into the Gulf of Finland. The population of the district is seven million.

Sixty-five percent of the Leningrad district's wastewater is treated in treatment plants that use a biologically active sludge. From the remaining 14 percent of wastewater only the solid wastes are removed. In Helsinki all wastewater is purified with an efficiency of over 90 percent.

It has been estimated that it will cost about one billion markkaa just to set up purification plants for Leningrad district's wastewater.

In addition to the problems present in the European portion of the USSR destruction of the ecology is beginning to be seen in the Asian portion also.

The BAM railroad, constructed with great socialistic zeal in the Buryat Autonomous Socialist Republic southeast of Lake Baykal, has disrupted the lives of the region's Evenk people, a people who live off the land. This BAM Railroad is one reason why the average life expectancy of the Evenk has dropped to 32 years.

The Evenk chances for survival may be reduced even further in the future. On Sunday the news bureau TASS reported that a diamond bearing formation has been found in Buryatia.

The environmental cooperation of countries on the Baltic Sea is being formed by a committee which will present a plan of action by the end of the year. At present the environmental ministries of the Nordic countries are sometimes doing duplicate work thus wasting money that could be better spent.

Finland began small scaled cooperation on environmental issues with the USSR and Poland a couple of years ago.

This fall experimental removal of phosphorus from Leningrad district wastewater will be started. There has been no agreement on the removal of other substances such as nitrogen, for example.

The enormous sulfur emissions of Estonia and Karelia could be reduced by remodeling the oil shale burning Narva power plants and the mining complex at Kostamus. Progress on such projects is slow due to financial difficulties.

#### The March to Disaster Began During Stalin's Time

Swedish professor Stefan Hedlund's report on the USSR's ecological problems is alarming reading. According to Hedlund many areas in the USSR have been irreversibly destroyed. The rest of the country is headed in the same direction.

The march of the USSR toward disaster began during Stalin's time. Huge industrial complexes with operations requiring wasteful consumption of natural resources piled up many environmental problems into the same geographic area.

Now one-fifth of Soviet citizens live in areas beset by an ecological catastrophe. 80 percent of illnesses are caused either directly or indirectly by the polluted state of the environment.

Only a little more than one-fifth of Soviet children under the age of seven can be classified as healthy. Children's nervous system disorders and allergies have increased manyfold since 1970.

Only half of atmosphere polluting factories make any effort whatever to clean up their pollutants. One-fifth of wastewater is left completely untreated and one-half is treated less than satisfactorily.

One-third of Soviet farmland is ravaged by erosional damage.

The construction of big dams and artificial lakes has flooded ten million hectares of forest and farmland. Surface mining has destroyed about two million hectares of land.

Forty percent of the country's wastewater is dumped into the Caspian Sea. Years ago 40 percent of the country's fishing catch was taken out of this sea.

The Black Sea is virtually dead due to nitrogen based fertilizers that have been washed into it.

The irrigation of farmland has made a desert out of what used to be the Aral Sea. What water remains is laced with salt and pesticides. Winds carry toxic clouds inland from the shores of the sea.

**Vorontsov Urges Common Environmental Policy for Republics**

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3 Sep 91*

[Text] Hamburg (DPA)—Nikolay Vorontsov, acting Soviet minister for the use of nature and environmental protection, has spoken out in favor of the 15 former Soviet republics having a common future policy not only in foreign, defense and economic policy, but also in environmental policy. In an interview in the Berlin *TAGESZEITUNG* which appears tomorrow, Vorontsov states that a jointly coordinated policy in this sphere is “even more important” than in the economy.

With regard to the environmental damage caused by nuclear weapons tests, Vorontsov spoke of “criminal actions” by a “mafia club” composed of the Soviet Union, the United States, France, and China. It is however not possible for one of the members to leave the club. All four states must jointly end nuclear weapons tests.

(An edited version of the text was pre-released to DPA.)

**Experts Debate Safety, Future of Nuclear Power Stations**

*914A1076A Moscow PRAVITELSTVENNYY VESTNIK  
in Russian No 24, Jun 91 pp 6-7*

[German Lomanov report under the rubric “Nuclear Power Engineering: the Anatomy of the Situation: The Nuclear Power Stations: ‘Get Rid of Them’ or ‘Go Ahead?’”]

[Text]

**If I Were a Terrorist...**

“I am about to create, at any reactor in the world, an accident that in terms of its scale will be comparable to the Chernobyl accident,” said Yevgeniy Olegovich Adamov, general designer and director of the Scientific Research and Design Institute for Power Engineering [NIKIET]. You will agree that this is an unusual statement when you consider that this institute is one of our leading scientific research centers in the field of nuclear equipment and technologies. The power reactor for the world’s first AES [nuclear electric power station] at Obninsk and the first reactor operating in the superheated steam range for the Beloyarsk AES, and the first multipurpose reactors for electricity and steam generation were developed from NIKIET designs. It was NIKIET that designed the RBMK-1000 reactor for the Leningrad, Kursk, Chernobyl, and Smolensk AES’s and the RBMK-1500 for the Ignalina AES.

And lest the reader entertain the suspicion that the director of a major institute is some kind of extremist hatching insidious plans, let me state immediately that we are talking about a hypothetical situation. We had gathered once again to talk about AES safety—a subject

that in our times is painful and periodically provokes sharp clashes in the political stadiums. But in general, it seems that the problem of nuclear power engineering in our country has been shifted from the scientific and technical sphere into the social sphere. And so we have tried to separate the wheat from the chaff and render to God what is God’s and to Caesar what is Caesar’s. We—that is, J. Tyror, head of the United Kingdom’s Atomic Energy Authority Safety and Reliability Directorate, N. Yermakov, administration chief in the USSR Ministry of Atomic Energy and Industry, Ye. Adamov, director of the NIKIET, and a group of science journalists. During the conversation, after reminding us of the old rubric entitled “Literary People,” Ye. Adamov made this remark:

“If I were the ‘director,’ that is to say the country’s President, and I decided to draw up a list of harmful production facilities that needed to be closed urgently, then the AES would not be among those at the top of the list, far from it.

“But if I were a terrorist would it be possible to cause an accident from the control panel? This is not a trivial question, for the Chernobyl catastrophe was the consequence of gross errors by personnel. Mistakes can be made involuntarily or deliberately.”

Then we heard the sentence that really did alarm us. Ye. Adamov added this:

“It is quite obvious that the skills of a general designer are not needed in order to do this; all that is needed is the knowledge of a middle-echelon engineer.”

We were crestfallen. Our society is so unstable, the social atmosphere is so explosive that a hypothetical situation may become a real one; need we remind you that undeclared but real war is going on in some regions. Let us assume that a group of terrorists that includes a competent expert seizes a power station. Or starts to blackmail one of its personnel. Delirium? Do not say that. Some AES’s have already been besieged, and the actions of the demonstrators were by no means correct—a brick was hurled at the director of one power station. We do not even need terrorists here—perhaps an operator may be so stressed that he cannot work reliably.

However, having first stunned us, Yevgeniy Olegovich then calmed us.

“I think that our discussion is more theoretical; it is almost impossible to organize an accident. There are many technical and organizational measures to protect an AES, and some of them in particular guarantee that lunatics do not finish up in the collective and that lunatics cannot reach some agreement or band together. I shall not go into detail but merely note that it is an extremely complex thing to start up a reactor. And if I were a terrorist I would find a simpler way.”

“And this has already been found—the Soviet authorities plus electrification of the entire country.” Someone

tossed in a rejoinder. Everyone laughed, but not very happily. You cannot forget Chernobyl.

"A nice joke," was Yevgeniy Olegovich's retort. "But joking aside, let me say that the degree of protection for atomic installations is considerably better than in other areas of potentially dangerous equipment. But we should not have the idea that a reactor is like some kind of boiling samovar. It is an installation in which enormous energy has been concentrated. You cannot play with it."

But the "Greens" and the national political forces who have come to the forefront in recent years have done that. Now, it seems, they have calmed down somewhat.

"I have the impression that the slogans 'Close the AES's' are used by many people in order to gain popularity and be at the center of attention," Ye. Adamov reflects. "The period when all ways were acceptable has not yet ended, but the wave of speculation is now apparently subsiding. And now the leaders of the public movements and parties are engaged with their proper business—politics."

In fact, populist statements have been replaced by sober evaluation. They tell me that the leadership in Armenia has already asked the Ministry of Atomic Energy and Industry to bring back on line the AES that was shut down. Is this so?

"Yes," answers N. Yermakov. "True, their proposal seems strange to me—start up the units on a temporary basis. This is unrealistic, not serious; as Yevgeniy Olegovich has already said, they are not samovars—boil the water, drink the hot tea, switch them off. Bringing a power station on line, and shutting it down, are very complex processes. But the fact itself is indicative. Incidentally, this is not an isolated incident; there is what might be called a trend. I was recently in Lithuania with the minister to discuss the fate of the Ignalina AES. Let me remind you that construction of the third unit was halted. It is time to sort things out; an army of construction workers is sitting around with nothing to do and must obviously be transferred to where there is work for people. 'No,' G. Vagnorius told us. 'It was not we who halted the construction, not even the K. Prunskiene cabinet, but the Sakalauskas government.' We are ready to talk. We have decided that the ministry should propose a scenario that suits the republic—maximum safety for the unit with optimal spending to complete construction.

#### "Foolproof"

AES safety. Whereas previously people used to believe in it unconditionally, since Chernobyl they do not believe in it at all. But the truth lies somewhere in the middle. Let me remind you that it was an RBMK reactor that went awry at the Chernobyl AES. And the argument still rages: who was more to blame for the accident—the designers or the personnel?

"Before the accident the RBMK reactors did not meet many of the safety criteria adopted in the West," says J. Tyror. "But since the accident a serious program has been put in place to modernize them, and now a Chernobyl-type accident is impossible."

The opinion of an "outsider," even more, of a highly qualified professional who is responsible for nuclear power station safety in Great Britain, was, of course, important for us. Yes, indeed a great deal has been done. The RBMK water-graphite reactor really did have design flaws. For those who would like to understand this just in general terms I suggest a small excursion into popular physics. The reader who is not curious about this may skip the next paragraph.

The most dangerous spontaneous kind of reactor runaway that can occur is when there is an unforeseen excursion or a change in the position of the control rods. This is what happened at the Chernobyl AES. If a reactor runaway has started it is very important that the runaway be stopped, whether by itself or not. This is determined by the sign of a number of physical characteristics: if it is plus, power continues to increase, if it is negative it falls. One of these characteristics—the so-called positive void coefficient—was insufficiently studied during the design work. But that would not have led to the tragedy if personnel had observed the operating rules. But as is known, they violated them. So here, the inadequate knowledge of the physicists was also seen in the behavior of the reactor, which was exactly the opposite of what was expected. Instead of "mitigation" from the protection system, additional reactivity was introduced, which facilitated the runaway and hence the destruction of the reactor. A simple analogy would be that of a pilot landing on a runway who "steps on the gas" but forgets to switch the turbines to reverse thrust, and instead of slowing down the aircraft accelerates sharply. I think that what follows is obvious.

Since the accident at the Chernobyl AES the possibility of spontaneous runaways have been eliminated at all RBMK reactors being operated in the country. By changing the physical characteristics of the reactor neutrons, the designers have achieved a more favorable relationship between the uranium and the graphite. More control rods were added for this (it is simply impossible for technical reasons to remove them from the active zone—just to remove one of them takes more than an hour, and there are about 100). The rods that damp the neutron flow can now be lowered in 12 seconds instead of 18. Backup systems have been developed and added to all RBMK reactors that guarantee reactor shutdown in two seconds—essentially instantaneously. This kind of protection insures against improbable events. A great deal has been done but... in answer to the direct question of whether or not J. Tyror would permit operation of such reactors in his own country, after a long pause, this is what the expert said:

"No. In their present condition your power stations do not meet Western standards. But... the same could be

said not only about Soviet reactors but any reactor that was built during the 1960's and 1970's. We and our Soviet colleagues have reached the conclusion that there are no obstacles to the development of a channel-type graphite reactor with enhanced safety; this concept is no worse than other scenarios for the development of nuclear power engineering. Now, as to the skills of your operators: they are no worse than ours. But you must change the psychology and try to achieve a situation in which every 'trivial matter' is dealt with carefully and fully in accordance with the standards. This attitude must become literally instinctive."

Here we must recall the words of the former director of the Chernobyl AES, V. Bryukhanov, who was blamed after the accident. He was blamed, essentially, for "holding the post he did"—not so much for his faults but rather for the design flaws of the reactor and the numerous mistakes made by personnel. He said that the designers had provided poor-quality products, that the enterprises were not making deliveries, that subcontractors were sending one piece of equipment instead of another, and that the operators were often violating their instructions. That was back in the years of stagnation. But is it really better now? No matter which producer one speaks with, they all complain about the catastrophic decline in production discipline. It seems that we have no need to fear terrorists, ordinary slipshod people will do.

In technical matters there is a term—"foolproof." The idea is simple: A design should be so reliable that it does not malfunction because of clumsy operation. Doubtful reorganizations have not been to the benefit of nuclear power engineering. First the AES's were transferred to the Ministry of Power and Electrification, then the Ministry of Atomic Energy and Industry [MAEP] was set up. Now the power stations are subordinate to the MAEP.

"MAEP is the successor to the former Ministry of Medium Machine Building, within whose system a strict rule was enforced—never punish people when they keep on turning off equipment," says N. Yermakov. "They were not punished even if a shutdown lowered the production indicators. But if anyone violated the rules, punishment was strict, even if everything turned out well. In the Ministry of Power and Electrification there was a different approach—the plan came first, then safety. I think that the fine traditions of the Ministry of Medium Machine Building will be revived and strengthened. Yes, modernization has enhanced the safety of the RBMK by about two orders of magnitude, a hundred times, but this does not mean that personnel can work in any old way. Incidentally, full-size simulators have been built at the Novo-Voronezh and Smolensk AES's to train them, and in the future the sector plans to set up simulators at all power stations."

#### Show the Product to Its Best Advantage

There is no such thing as absolutely safe equipment. This is why I once asked the chief of the nuclear power

engineering department in the government apparatus, G. Kopchinskiy, what degree of risk can be considered acceptable. Georgiy Alekseyevich answered thus:

"The Americans have the agreement of the public for a level of risk expressed as  $10^{-6}$  accidents per reactor per year."

"To put it more simply, that is one accident each one million years? Impressive..."

"No, that simplification will not do. First, no power station will operate for a million years; it will be thirty or forty years, maximum. Second, opponents will immediately find persuasive objections to your metaphor: Fine, we may wait a thousand years for an accident or it may occur in the first year. Let me offer another more accurate comparison. Might a man be killed because a meteorite falls on his house? Yes, theoretically that could happen, but the probability is infinitesimally small. There is about the same probability of an accident at an AES if we express the risk as  $10^{-6}$ ."

"There is now no need to set all the dogs on the designers," says Yevgeniy Olegovich. "They were moving down untried paths, and many reactor flaws can be explained by the incomplete nature of their knowledge. For even after the accident it took six months to model the situation on supercomputers; which, incidentally, the designers did not have two decades ago. The accident has in no way discredited the idea of the channel-type reactor, it has served merely to show a flaw in the specific technical solution and the irresponsibility of personnel. I make bold to assert that in terms of its conception the RBMK reactor is safer than the VVER and foreign analogues. The containment building of this reactor cannot be destroyed for the simple fact that it does not have one. This equipment is better protected against loss of coolant than reactors housed in containment buildings. Finally, when the RBMK is operating, fuel loading is continuous, and this means that there are fewer fission products in the active zone. And I do not exclude the possibility that the time will come when work will be continued on better designed channel-type reactors."

It is common knowledge that it has been decided not to build new units with RBMK reactors, while existing RBMK's are to be withdrawn when their service life ends. But neither modernization of the RBMK nor the development of improved new reactors, nor ideal training for personnel is a guarantee against accident. People must understand that the genie may get out of the bottle. There is no need to make a bugaboo out of nuclear power engineering, but people should not be fed unrealizable illusions—this is the thought in the refrain that ran through our conversation. You will agree that this is quite a different stance than that assumed by the atom people in former years who assured society that the AES was absolutely reliable. But given this praiseworthy candidness, how can we raise the prestige of the AES, which has now fallen so low?

"There is no need to act like a silly woman who suddenly takes it into her head to start tugging at the sleeves of the inhabitants of a small town where everyone knows her, to assure them of her own fragility," says Ye. Adamov. "I heard this comparison from a French colleague. The nuclear people have behaved like this kind of confused person, and of course, no one believed them. But the chemists do not shout about how good their sector is. They show their product to its best advantage—look, here is some fine fabric, look at these wonderful paints, see these amazing plastics.

"Obviously the nuclear people must also 'go to the people,' not with technical arguments, which for the layman is a murky forest, but with economic statistics. Talk to the local authorities—if the inhabitants of your region are willing to vegetate in the rut of an energy hunger, then reject the AES. If you want to live like civilized people, invite the experts in and study the plans. Only let us act without rowdy meetings and speculation. Among the nuclear people one popular but bitter joke is that if you want to find a fault in the earth's crust, don't call in the geologists, call in the people who design AES's, and a fault will immediately be found.

"And if you can make do with windmills, use them and good luck to you," Yevgeniy Olegovich continues. "But the fact is that the proponents of alternative energy sources do not honestly admit that even after a century they will provide no more than one-tenth of the energy required. So what do we do—burn coal, contaminate the environment, and rob our grandchildren and great-grandchildren?"

Raised on the ideas of Bolshevism we remain people of extreme views. It is high time to abandon both the cries of "Get rid of them" and the panegyric of "Long live!" It is time to weigh the pros and cons in a well-considered way and reflect and reach healthy conclusions. About our life in general and about nuclear power engineering in particular.

#### Facts To Think About

Almost one-fourth of the oil reserves have already been recovered from the bowels of the earth. If present rates of recovery are maintained there is enough "black gold" for about 30 years. The same applies to the use of natural gas in power engineering, which together with oil is being used increasingly by mankind as a technological raw material. There is still coal, and reserves are six or seven times greater than oil and gas reserves. But a thermal electric power plant operating on coal is an ecological bomb. It constantly pours gas and ash into the atmosphere, along with the oxides of sulfur and nitrogen, which are very harmful for all living things. Moreover, all the electric power stations operating not only on coal but on any fossil fuel, burn oxygen, so that there is less and less of it on the planet.

According to figures from an independent Austrian organization that does prediction studies, acid rain (of which the main source is power engineering facilities

operating on fossil fuels) will during the coming century be the cause of the destruction of 118 million cubic meters of standing forest in Europe each year (35 million cubic meters in the European part of the USSR). If, of course, no steps are taken to restrict emissions of sulfur dioxide and nitrogen oxide. Each year the economic losses from acid rain in Europe will total 16 billion pounds sterling.

"Imagine a car in which all the passengers are smoking. The car windows are closed and the temperature inside is 30 degrees. This is precisely the prospect that awaits mankind unless global measures are implemented to deal with the greenhouse effect." These words are taken from a report on a meeting of the environment ministers from the 12 EC countries. It is the opinion of the experts that "if everything remains as it is," in 40 years the average temperature on the planet will have risen by about one degree, and by four degrees by the year 2090. The consequences will be extremely regrettable: a melting of the icecaps, flooding in some regions, and severe drought in others.

A special working group of an intergovernmental commission on climate change, led by the Dutch scientist (P. Vellinga) has been studying the problem of the greenhouse effect and the associated global warming, and has concluded that as a result of the melting of the ice-caps and thermal expansion of the waters in the world's oceans, sea level will rise one meter, and this will have a significant effect on the lives of at least 300 million people in various countries in the world. Experts are calling on state figures to seriously address the impending danger of flooding, which is already real when, for example, because the sea level is rising only 1.2 millimeters each year, in the region of Jakarta this has led to the penetration of sea water to a distance of 15 kilometers onto dry land. Chinese scientists have calculated that a rise in sea level of only 50 centimeters will lead to total inundation of Guangzhou, a city with millions of inhabitants.

It would seem that energy derived from falling water would be clean. However, carried away with the construction of the state power stations, we have flooded territory as large as France and several other states. And the losses in terms of fertile land, forest, and fishing grounds sometimes exceeds the advantages from the electric energy that we obtain.

Energy obtained from making use of the Sun, wind, and so forth, can play only an auxiliary role, less than 10 percent of future energy needs. The reason for this is the low density of these kinds of energy. For this reason, the cost of producing solar and wind power is high. Some 2,550 kilowatt-hours are used to produce a one-meter-square panel with solar elements using present-day technology, but provides only 100 kilowatt-hours. This means that it takes 25 years to produce the same amount of electric power that was used to make the solar panel itself.

When we talk about nuclear power stations we should not forget that in general we are living in an age of dangerous technologies, among which nuclear power engineering is not the most dreadful monster. For example, six years ago at an American chemical plant in Middleport an accident occurred that took 2,500 lives. About 50,000 people were poisoned by isocyanate methyl, and 200,000 people had to be evacuated. In the same year there was a fire at a plant in Bhopal (in India). Again it was isocyanate methyl, and even the number of deaths and poisoned and evacuated people were the same. The list of accidents of this kind could be continued; during the past decade and a half more than 50 major industrial accidents have occurred.

The Persian Gulf crisis once again demonstrated the dependence of industry in the developed countries on oil imports and the need to reduce this dependence by switching to other energy sources, including nuclear. A total of 428 nuclear units in 26 countries are making it possible to save six million barrels of oil (950,000 tons) each day, which makes up more than one-third of daily output in the Persian Gulf countries.

In Japan they are building nuclear power stations at a distance of 400-500 meters from the city limits. Solid ground is selected for construction in areas least susceptible to earthquakes (seismicity is quite high in the Japanese islands). A total of 27 nuclear power units are being operated in the country, providing almost one-third of electric power. Because of the high level of safety, almost all Japanese nuclear power stations have been built on the territory of national parks or in resort areas, with beaches, yacht clubs, sports complexes and fishing cooperatives nearby.

A public opinion poll conducted in Japan two years ago demonstrated mixed feelings among the Japanese about nuclear power engineering. More than 60 percent of respondents believed that Japan's need for nuclear energy will grow in the future, while 51 percent believed that nuclear energy will be the main energy source during the next decade.

In Sweden the policy of the ruling Social Democratic Party in the field of nuclear power engineering has changed. Few people now believe that the first nuclear power units will be shut down starting from 1995. The latest public opinion polls show that a significant majority is against shutting down the nuclear power stations in the near future. Voices are being heard more often in defense of the idea of building new nuclear power stations in Sweden.

In the United States the use of nuclear energy makes it possible to reduce emissions of sulfur dioxide by five million tons annually; the corresponding figure for nitrogen oxide is two million tons. This is half of the total amount set by President Bush as the target for reductions in emissions by the year 2000.

Speaking at the opening of the 14th World Energy Conference in Montreal, the head of the Central Electricity Generating Board of Great Britain, Lord Marshall, said: "I can understand the fear of a nuclear accident but dread of radioactivity is for me inexplicable and devoid of logic." It is the opinion of Lord Marshall that safety can be reliably guaranteed in nuclear power engineering by present-day technical means if the human factor is taken more fully into account. As far as radioactive emissions are concerned, the natural radioactivity in the earth's crust is 80 billion times greater than the technogenic radiation background.

### **Chernobyl Aid Account Expenditure Figures**

*91WN0647D Moscow IZVESTIYA in Russian  
27 Jul 91 Union Edition p 7*

[Article by S. Mostovshchikov: "A Fine Kettle of Fish and Account No 904"]

[Text] The Committee To Eliminate the Consequences of the Chernobyl AES Disaster distributed through TASS channels to the State Committee on Emergency Situations of the USSR Cabinet of Ministers a report on the expenditure of funds from Account No. 904, the "Fund To Aid in Eliminating the Consequences of the Chernobyl AES Disaster." This paper has the following contents:

"After the disaster at the Chernobyl AES, a current account, No. 904920, the "Fund To Aid in Eliminating the Consequences of the Chernobyl AES Disaster" was opened on 16 May 1986 at the request of numerous working people. According to data from USSR Gosbank, during the period 16 May 1986 through 1 July 1991, voluntary contributions from citizens and organizations amounting to 544,658,500.82 Rubles went into this account.

The expenditure of the money in this account was carried out strictly in accordance with orders of the USSR Council of Ministers and the USSR Ministry of Finance for use by the Union republics, ministries (agencies) and organizations to reimburse expenditures related to the elimination of the consequences of the Chernobyl catastrophe. The actual expenditures consisted of:

R425,000,000 for capital investments in housing and municipal service facilities for resettling residents from the affected regions;

R35,220,106.44 for compensation payments to the population for lost property, fruit and berry plants and uninsured agricultural animals;

R65,853,136.60 to discharge debts of the USSR Minatomenergoprom (Ministry of the Atomic Energy Industry) for expenses related to eliminating the consequences of the Chernobyl AES disaster;

R154,456.12 for payment of Soyuzkhimfarmotorg (All-Union Office for Trade in Chemicals, Pharmaceuticals and Hygienic Goods) expenses to acquire reagents;

R5,800,000 to the Belorussian SSR Gosagroprom (State Agroindustrial Committee) to compensate losses of contaminated meat;

R1,500,000 to USSR Minatomenergoprom to pay expenditures for the passage, accommodation, food, transportation and other services for the foreign scientists and other specialists, as well as the Soviet specialists accompanying them, who were participating in the conduct of an independent international expert assessment of the consequences of the Chernobyl AES disaster.

Funds amounting to R5,843.90 which were transferred voluntarily at a previous time have been returned to people who are unable to work.

Total expenditures of funds from the account during the indicated period amounted to R533,533,543.06

As of 1 July 1991 the funds remaining in account No 904920, the Fund to Aid in the Elimination of the Consequences of the Chernobyl AES Disaster, amounted to 11,124,957.76."

As the editorial board managed to clarify, the need to share with the people—after five years—data on how the money they gave has been spent, was prompted by the new practice of concluding agreements with trade unions on labor and socioeconomic issues. The USSR Cabinet of Ministers, when negotiating with the GCTU [General Confederation of Trade Unions of the USSR], agreed, among other things, to print these figures in the newspapers.

In conversation with an IZVESTIYA correspondent, Viktor Gubanov, chairman of the Committee to Eliminate the Consequences of the Chernobyl AES Disaster and deputy chairman of the State Committee on Emergency Situations, noted that no one ever made a secret of these data; they simply were not published widely. They are now being published widely, and this perhaps will again attract citizens' attention to Account No. 904.

The need for citizens' attention is dictated, it seems, by the name of Account No. 904—"Fund to Aid in Eliminating the Consequences of the Chernobyl AES Disaster," which, as Viktor Gubanov says, has existed since the account opened. However, looking through the newspapers for 1986, we did not find this name. More often we came across other formulations—"Fund To Help the Victims of the Disaster" or the "Chernobyl Aid Fund."

The difference, strictly speaking, is a real one because the pensioners and working people who turned in their rubles by the tens and hundreds to the banks, hardly intended to see them entered, for example, under the column labeled "to discharge debts of USSR Minatomenergoprom for expenditures related to eliminating the consequences of the disaster." There is every reason to assume that such a "discharge of debts" is,

generally speaking, the problem of Minatomenergoprom itself or of the state, but not of the ordinary citizen, who with his own small amount of money wanted to achieve one thing—to help his fellow citizens whom the state forced to undergo all the charms and shortcomings of radiation. But clearly this state feels only the charm of the ready cash which is circulating among the public, the subject on which it is providing information in its reports in the newspapers a little bit late, it is true, but better late than never.

#### Inspector Cites Unsafe Practices at Lithuania's Ignalina Nuclear Plant

91WN0644A Moscow IZVESTIYA in Russian 29 Jul 91  
Union Edition p 2

[Article by A. Illesh: "Do We Want To Have Safe Nuclear Power Stations?"]

[Text] In May the editorial board received a shocking report: at the Ignalina Atomic Power Station personnel were being overexposed to radiation! The post-Chernobyl nuclear allergy was pushing us toward the immediate publication of this sad piece of shocking news. Nonetheless, we decided that instead of hurrying, we would wait for the results of the official investigation of the incident. A USSR Gospromatomnadzor [Committee for State Oversight of Safe Operations in Industry and Nuclear Power Engineering] commission presented to IZVESTIYA a document entitled: "Act No. 2 of the Investigation of a Violation in the Operation of an Atomic Plant." When reading it, the thing that strikes one first is that the violation was not discovered until two days after the event.

S. Ryabinin, state inspector at the Ignalina AES [Nuclear Electric Power Station], talks about what happened with significantly more emotion than does this document. The specialist is convinced that within a very few minutes three employees at the Ignalina AES received doses of external radiation greater than the maximum permitted in a year; this is a sad but, alas, almost natural result of a situation which is now typical of many atomic power facilities. What makes it possible to draw such conclusions from a case which, although extremely unpleasant, is nonetheless quite a local one? Let us follow the logic of the inspector, a man who monitors directly the operational safety of the plant.

Like everything that happens in our country, the emergency situation at Ignalina took place extremely simply. Instead of a simulator they simply took from the cooling pond a fuel assembly depleted in the reactor (and for that reason dangerous!); projects were simply carried out in violation of the conditions of the program agreed upon with the state supervisory organ; the installation of the radiation monitoring system simply was not completed in that chamber where the work was being conducted; there was simply the usual hurry and hope that everything would be all right.

Of course the radiation doses, which totaled from six to 13 REM's, in recent years would have prompted only a

smile from veteran nuclear-plant workers. And on the basis of my own experience, I would make so bold as to claim that from those who spent the end of April and May in Chernobyl, they would arouse only laughter. But times are different now.

S. Ryabinin writes: "The USSR Gospromatomnadzor commission has categorized this incident as a radiation accident, and this was done, despite the objections of representatives from the AES, USSR Gossannadzor and the trade union's central committee. For the sake of fairness, I would note that this radiation accident might not have been if the AES administration had covered up the actual incident. And it had the opportunity to do so. By itself the fact that this "insignificant"—in terms of yesterday's measuring stick—radiation was being investigated indicates the changes in the management of the nuclear power industry. On the other hand, how the emergency occurred and the measures which were taken afterwards do not inspire optimism. I can only state that, as before, a lack of respect for norms and rules "flourishes" at the AES, and after the emergency the endlessly familiar attempts find fall guys were made."

Not satisfied with stating the fact that it is again becoming dangerous to work at the AES, the state inspector tries to find the roots of this situation. The essence of his arguments consists of the following.

Having condemned the "fall guys" at Chernobyl, the state (or more accurately its leaders) did not find the courage to name the global culprit in the Chernobyl catastrophe. And this, the inspector thinks, is the "system." Or more accurately, the system of lawlessness. It is a paradox that while the priority that power generation has for stabilization of the economy is recognized at all levels of power, the parliament still has not adopted laws regulating the activity of a key unit—the nuclear power industry. And if, God forbid, another Chernobyl takes place? Who will be guilty of that? "I do not know if Sweden has a law concerning the improvement of efficiency or a law, for example, about the local KGB, but I know for sure that there are three laws regulating the nuclear power industry there. And that is for a total of 12 reactors." And the conclusion: in our country the discussions about the safety of existing AES's are largely for effect. Since Chernobyl little has changed in the general approach to global problems.

Technically, of course, the AES's have been partially improved. (On the other hand, a series of specified measures has been "successfully" knocked down). But, and this is the main point, the system-wide approach to the resolution of AES problems remains as before. The lack of laws leads to the lack of any kind of legal responsibility for all officials in charge of safety. In addition, the nuclear power industry has become extremely convenient "small change" in the struggle for power.

The green movement should be welcomed if it aims at protecting the environment and if it has no immediate

political intentions. But frequently the rallies and pickets around operating AES's strike only at the moral-psychological situation among personnel who service the potentially dangerous facility. "I want to remind everyone," writes S. Ryabinin, "that it is not a crazed 'atomic lobby' sitting behind the reactor instrumentation panel in the various AES offices; they are normal people who love their children and their wives, who have their habits and feelings. And if society seriously wants to have safe AES's it is essential to resolve urgently not only the technical questions but also the purely human ones. There should no instance of a reactor operator who brings home to his family a salary which is less than a tenth of what an average secondhand dealer at the markets of Vilnius or Moscow earns. After all, he is also a producer! It is difficult to imagine, but take a ruble of fixed capital for a producer of output; the Ignalina AES yields a profit which is 12.8-fold less for that same ruble for a distributor of output—Litovenergo...Is it not here that the paradoxes of safety are to be found? Is it still not clear that one has to pay for safety? And pay handsomely for the miser pays twice..."

But this is by no means all.

The inspector claims that the existing form for state supervision of safety in the nuclear industry has already exhausted itself: it was established on the basis of the command-administrative system. After all, despite the administrative measures being taken by the inspectorate, the safety norms continue to be violated at many AES's. The sharp decline in the living standard of families of inspectorate personnel, as well as the drop in the prestige of the inspectors' work (the salary is lower than the salary of an AES technician despite a level of responsibility and skill requirements which are not comparable), are already having an effect. The system of outside (nonagency) supervision is liquidating itself. A pauper (in principle) cannot defend the interests of the state.

And at the end a short summary which, no matter how paradoxical it may seem, follows from the "routine" overexposure which took place at Ignalina. The lack of a law on the nuclear industry and the subordination of the state supervisory organ to an economic one—the Cabinet of Ministers—make it impossible to effectively monitor the operating AES's. But if one is telling the whole truth, it should be said that even after Chernobyl the AES's with RBMK [uranium-graphite channel type reactor] reactors still have quite a few deficiencies from the standpoint of safety. For this reason the operation of such plants without fundamental changes in the affairs of the nuclear industry cannot be considered safe today. Only a law and a real program of action—supported by the necessary financial and intellectual resources, as well as modern technologies—can guarantee the country against a new Chernobyl.

One can argue with the favorite positions of an ordinary "atomic worker." But one must agree with him on one point: lawlessness has never yet led to good results. And

in the nuclear industry the USSR already has behind it a terrible experience—the worst catastrophe of the 20th century.

**Semipalatinsk Nuclear Test Range Closed**

*LD2908175791 Moscow TASS in English 1746 GMT  
29 Aug 91*

[By TASS correspondent Vladimir Akimov]

[Text] Alma Ata August 29 TASS—Nursultan Nazarbayev, the president of Kazakhstan, today issued a decree about the closure of the Semipalatinsk nuclear proving ground.

It is said in the document that nuclear weapon tests have been conducted on the territory of the Kazakh Republic in the Semipalatinsk region since 1949. Some 500 nuclear explosions were made over the period, damaging health of thousands of people.

In view of the fact that the Kazakh Republic has fulfilled its duty for the creation of a nuclear potential that ensured strategic military parity between the USSR and the United States and, taking into consideration the demands of the Kazakh public, it has been deemed expedient to close the Semipalatinsk nuclear proving ground from the moment of the signing of the decree.

The Cabinet of Ministers of the Kazakh republic has been instructed upon agreement with the USSR Defence Ministry and the USSR Ministry of Atomic Energy and Industry to transform the Semipalatinsk proving range into a union-republican research centre. It is proposed to work out and endorse its status and the list of the main trends of research as early as in 1991.

In connection with the fact that damage was done to the health of the population in the districts adjoining the Semipalatinsk range during nuclear tests in the air and underground conducted from 1949 to 1962, the amount and procedure of compensation to citizens of Kazakhstan who have been affected is to be determined jointly with union bodies.

In accordance with the decree the Union ministries and agencies involved in the staging of nuclear explosions on the republic's territory should endorse the program of social and economic development and improvement of living standards and medical services for the population of Semipalatinsk, Karaganda and Pavlodar regions adjoining the range and to draw on finance from appropriate Union sources for the purpose.

**Joint Soviet-Swiss Venture To Exploit Oil Refinery Waste Products**

*91WN0647C Moscow PRAVDA in Russian 15 Jul 91  
Second Edition p 2*

[Article by PRAVDA correspondent Z. Kadymbekov: "Hard Currency 'Out of Nothing'"]

[Text] Baku—A joint Soviet-Swiss enterprise has started its operations. It was founded by the Novobakinskij Oil Refinery imeni Vladimir Ilich and the Mark Rich Company.

The essence of the contract, the director A. Guseynov told me in conversation, is extremely clever, and there is no better way to illustrate the idea that business people are capable of making a profit "out of nothing," or in this case out of production wastes.

The joint enterprise has taken a long-term lease on all the plant's treatment facilities. The Swiss, who have started a general overhaul of the facilities, brought to Baku an Alfa Laval apparatus and other equipment for cleaning wastewater. The Alfa, which operates on the basis of the centrifuge principle, possesses miraculous capabilities: it not only traps petroleum wastes in the effluent, but it also removes mechanical impurities from it. As a result, the wastewater is fully treated, and the raw material extracted from it is sent for reprocessing. The petroleum products obtained are sold abroad by the joint enterprise for hard currency.

**Urals Ecological Parliament Formed**

*91WN0645A Moscow DELOVOY MIR in Russian  
6 Jul 91 p 4*

[Article by Ilya Udachin, DELOVOY MIR correspondent, Sverdlovsk, under rubric: "Ecology: How the Urals Breathe..."]

[Text] The Urals are uniting. They are uniting not on the basis of an order from on high, but for reasons that have been dictated by common sense. Under the conditions of a "bouquet" of crises (economic, ecological, spiritual, etc.) that have struck our country, the unification of efforts is viewed as one of the necessary steps on the path to the rebirth of the region—overall problems have to be resolved jointly. And this pertains primarily to ecological problems, for which, truly, no borders exist.

It must be immediately stipulated that the Urals are still unimaginably remote from resolving their ecological problems. It is still too early to talk about what goals have been planned to overcome them. The basic task at this moment is apparently the changeover of the appropriate services from a mode of grasping one's head in one's hands on the threshold of the catastrophe that has overtaken us, to a mode of searching for clear-cut formulations. As everyone knows, before resolving a task it is necessary to understand what that task consists of.

It is precisely these goals that are served by the creation of the Urals ecological parliament that was created at a session in Perm. The participants in the work of the ecological parliament include people's deputies of the republic and oblast soviets that represent the Udmurt Republic, the Republic of Bashkortostan, the Komi Republic, and Kurgan, Perm, Orenburg, Chelyabinsk, and Tyumen oblasts. To use the words of one of the cochairmen of the parliament, V. Morokov, chairman of

the permanent chairman of the Sverdlovsk Oblast Soviet's permanent commission for ecology, the protection of the environment, and the efficient use of natural resources, something that became yet another factor that determined the creation of that structure was the difficulties that each oblast, taken separately, comes up against when defending its interests in the protection of the environment. If the efforts are united, one begins to see the operation of the "broom principle"—individual twigs, each of which breaks easily, are combined to form a strong bundle that is difficult to break. The probability of achieving the necessary results increases.

In accordance with the Statute Governing the Urals Ecological Parliament (which statute will be finally approved at the second session in autumn of this year in Sverdlovsk), it is made up of deputies working in the appropriate commissions at oblast and republic soviets. The chairmen of those commissions became parliament cochairmen. Persons who can be parliament members are RSFSR and USSR people's deputies from the particular territories, as well as oblast soviet deputies who are not part of the ecological commissions, the procedure for acceptance of whom will find its expression in the regulation. Representatives of monitoring organizations and agencies that administer environmental-protection activity, scientists, and enterprise specialists can be part of the parliament with the right of voice, but no vote.

The decisions made by the parliament must be ratified at sessions of the oblast and republic soviets. The parliament proposes coming forth with legislative initiatives at the Russian and union levels.

#### Basic Areas of the Parliament's Activities

##### 1. Radiation Security

A number of operating nuclear projects, enterprises in the nuclear industry, and burial sites for radioactive waste products are located on the territory of the region. Many of them are situated close to major cities. It is terrible to think of what the consequences of an accident at those projects might be.

##### 2. Problem of Water Resources and Water Purity

The oblasts in the Urals region share common sources of water supply. V. Morokov particularly mentions the watershed situation of Sverdlovsk Oblast: the sources of the water-collection areas on the western and eastern slopes of the Urals Range—the water-collection area of the Kama and of the Ob—are formed on its territory.

Perm, Kurgan, and Tyumen oblasts and Bashkortostan are situated downstream on those rivers. Obviously it is in their interest to have a more intensive resolution of the problem of water pollution on the territory of the neighboring oblast.

And there are things that have to be resolved. According to the information from Uralgidromet's [Urals Hydrometeorological Service] territorial center for observations

on the pollution of the environment, the Iset River, within the Sverdlovsk city line, is polluted by heavy metals (specific figures were not given), by substances containing nitrogen (in April, 14 PDK [maximum permissible concentration], and by petroleum products (in April, 44 PDK). Below the city, the river is chronically polluted by hydrogen sulfide, the consequence of the overloading of the city's purification structures. An especially painful problem is the Chusovaya River. In may the concentration of 6-valence chromium in that river downstream from Pervouralsk (where the bichromate plant is situated) exceeded the norm by 450—yes, 450!—times. Farther on, the Chusovaya flows over the territory of Perm Oblast, and the city of Perm itself collects drinking water from it. There exists a tradition going back many years, in accordance with which Perm regularly initiates court action against the bichromate plan and other "polluters" on Sverdlovsk territory, and the city itself expends considerable amounts of money to purify the drinking water. It would undoubtedly be more effective to have a coordinated program for protecting the water. It is time to change over from fighting the consequences to eradicating the causes. This would be more effective both from the positions of ecological security and from the economic point of view. Incidentally, this approach coincides with the new concept of the U.S. Environmental Protection Agency (see DELOVOY MIR, 8 Jun 1991), in accordance with which the effect exerted upon the source of ecological danger itself must be at the basis of the environmental-protection measures. Why shouldn't this be a reason for interaction between the Urals and American specialists?

##### 3. Protection of the Atmosphere (and the Biosphere as a Whole)

The spreading of atmospheric emissions to tremendous distances necessitates the coordination of programs and their joint financing.

The ecological parliament did not engage in applied legislative action at the session in Perm. Rather, it formed the basis for further work. This pertains primarily to the question of **assigning to the Urals region the status of an ecological disaster zone**. Today there do not exist any legislatively established criteria in accordance with which the question of such zones would be decided. Specialists at the Environmental Protection Department of Perm Polytechnical Institute have undertaken the more detailed working out of the criteria. The draft for the appropriate legislative act is supposed to be submitted to the next session.

There was a discussion of the question of creating a system of time-responsive and well-equipped monitoring services, as well as the rules and criteria for monitoring the pollution of the environment in the Urals.

The parliament stated clearly that there is a need for changes in the structure of administering the environmental-protection activities. The functions of use of the natural environment (that is, the granting of licenses; the

determination of quota limits) and of monitoring that use must be subdivided among the various organizations. In turn, the interaction among the oblasts must be regulated by contracts that must stipulate the questions of compensations in the event of violating the contract terms. The second session of the parliament will have to make specific decisions concerning the coordination of the work of the environmental-protection organizations in the Urals.

It is necessary to dwell separately on the question of forming cooperatives among the conservation enterprises in developing and producing environmental-protection equipment. The following paragraphs summarize the information that was presented by I. Lobov, deputy chairman of the Sverlovsk Oblast Committee for the Protection of the Environment.

Contact telephone numbers: V. Morokov: (3432) 58-96-82; I. Lobov: (3452) 58-98-93.

Name of enterprise: Urals Electrical Engineering Plant, Sverdlovsk. Name of article: Transportable mass-spectrometric analyzer. Comments: Enables the simultaneous determination of 15-20 ingredients; range of the mass numbers constitutes 2-400 atomic units of mass (nitrogen oxides, sulfur dioxide, hydrogen sulfide, phenol, toluene, etc.). Can be used in laboratory, production, and field conditions, including on means of transportation and as part of mobile laboratories for monitoring the environment. Name of article: Spiral-12 atomic-absorption spectrophotometer. Comments: Can be used to monitor the quality of drinking water, natural water, analyzing runoff water for toxic metals, analysing the air environment, soil, agricultural output, in medicine for determining the content of metals in the blood, tissues, etc. Determines 22 ingredients, including arsenic, lead, chromium, bismuth, cadmium, copper, etc. Detection limits: 10 to the -3 micrograms/milliliter. Tungsten spiral was used as an electrothermal analyzer; this made it possible to reduce the size and bulk of the instrument, and to reduce the operating expenses. As of the present time, operating mockups of these two instruments have been manufactured. The initial phase of the NIOKR [scientific-research and development] was financed in the amount of 900,000 rubles. The successful completion of the operations and the assimilation of series production require financial assistance. Proposed deadline for implementation: 1993.

Name of enterprise: Urals Electrochemical Combine, Verkh-Neyvinsk, Sverdlov Oblast. Name of article: neutralizer of vehicle exhaust gases [catalytic converter]. Comments: Proposed deadline for implementation: 1993 (200,000 a year).

Name of enterprise: Ekopor NPO [scientific-production association]; Verkh-Neyvinsk, Sverdlovsk Oblast, telephone number (343270) 2-28-77. Name of article:

Regeneratable filters with baked powder cartridge-filters. Comments: Used to trap and collect heavy particles from the exhaust and technological gases of metallurgical, construction, nuclear, and other production entities. Provide for the capturing of more than 99.99 percent of solid aerosols, including those with a diameter of less than three micrometers. Manufactured from nickel, chrome iron, and stainless steel. Filter service life: more than 10 years.

Name of enterprise: Mayak (sic!) PO [production association]. Name of article: Individual dosimeters for the public. Comments: With an indication of levels "below normal" and "above normal." Price: 100 rubles (1991). Volume of production: 1991, 1000 items; 1995, 50,000 items.

Name of enterprise: Uralkhimmash PO, Sverdlovsk. Name of article: Unit for evaporating runoffs. Drum-type vacuum filters for filtering and trapping heavy particles.

Name of enterprise: Khimmash NII [scientific-research institute], Sverdlovsk. Name of article: belt-type press filters for dewatering postfecal runoff water. Comments: Used in the city of Verkhnyaya Salda.

Name of enterprise: NPO imeni Kirov, Perm. Name of article: Technology for processing automobile tires to make rubber crumbs with the extraction of metal cord. Comments: Implementation deadline: 1995.

Name of enterprise: Machine-building Plant imeni Lenin, Perm. Name of article: Antiemission apparatus for petroleum machine building. Comments: Long-range program. Implementation deadline: 1995.

Name of enterprise: Iskra NPO, Perm. Name of article: Industrial unit for ecologically pure technology of continuous oxidation of vegetable oils for the production of drying oil. Comments: Technology and unit are based on the use of electromagnetic and hydrodynamic activation of the process.

#### Pollution, Contamination Problems in Former Closed City of Tomsk-7

91WN0644B Moscow IZVESTIYA in Russian 2 Aug 91  
Union Edition p 4

[Article by IZVESTIYA special correspondents V. Kostyukovskiy and Yu. Perepletkin, Salekhard, and Greenpeace members Vittse Van Der Naald, Holland, and Mikhael Hoffman, Germany: "Secrets of a Closed City"]

[Text] This city is not on the map of Tomsk Oblast. It is not there, although for some time we have been sailing down the Tom River alongside it. The river bank reminds one of a country's national frontier: kilometers of barbed wire stretch out ahead. It is as if the city does not exist, although it occupies an area greater than

20,000 hectares and has more than 100,000 residents. Tomsk-Seven is announced in English, German and Russian on the ship.

One can now write as well as talk about this. But before, it was an open secret; one of the authors, a native of Kemerovo, knew as a child about the existence of the "closed" city, which was punningly called the "Atomsk-kiy" (Atomic) city. But times are in fact changing and the day before we—two Americans, one German, four Dutchmen and the same number of Russians—had visited the "closed" city.

In this area there are many rumors about this city and combine, as well as the ecological and radiation situation. We spent two days in the oblast center. And during this time we managed to hear a lot and read a lot. And when it was time to go to Tomsk-Seven, Greenpeace staffers Mikhael Hoffman and Vittse Van Der Naald said firmly: "We will not take any instruments with us and we will not take any samples. Judging by everything, the ecological problem of Tomsk-Seven requires a large-scale, comprehensive study. We are not in a position to do that."

We understood it this way as well: the problem of a "closed" city in our country is even now not only a scientific problem but also a production one. And it remains to a significant degree a political problem. The Greenpeacers do not want their prestigious organization to be drawn into the politics of it. And in fact, they might have taken instruments with them and carried out some kind of research. In that case some officious type could have subsequently shown off: there, you see, he would say, even Greenpeace did not find anything at our place.

However, we, the Soviet journalists, cannot avoid these problems. And the main one, in our view, is that the excessive secrecy has not brought anything good for a long time.

At a meeting with us, specialists from the combine (the meeting took place in the gorispolkom) tried to convince us: "The radiation situation is commensurate with background levels, which are determined by global radioactive fallout...the level of radiation safety at the combine is quite high..."

"That is," asked a member of the expedition, "there are no pollutants which would be dangerous to the residents?"

"No," answered one of the specialists, "there are practically none."

People are most upset by the fact that during the 30-year operation of the atomic production plant, about 127,000 tons of solid and about 33 million cubic meters of liquid radioactive wastes have been collected in underground storage facilities. The specialists reassure them that there is "practically no danger." But people do not believe them. People are afraid.

It was not so long ago that ROSSIYSKAYA GAZETA quoted from an official document compiled by specialists from Tomskneftegasgeologiya: "The Sibkhimkombinat (Siberian Chemical Combine) burial sites are located 10-12 kilometers from the river Tom. The wastes are pumped into sandy beds at a depth of 220-360 meters. In the immediate area of the burial sites these beds are covered with uniform, water-resistant clayey strata; however, throughout the region as a whole these strata can thin out..." And that is not all. Some employees at the combine claim that for many years the combine has been dumping liquid radioactive wastes directly into the Tom.

Upset by this situation, 58 deputies of the oblast soviet directed an inquiry to the director of the combine, G. Khadorin. In his reply he indicated the quantity of wastes and noted that the total contamination level is not determined; the director went on to say in particular: "...Information on the activity level of the combine's buried liquid manufacturing wastes is secret."

Every state has its own secrets which must be kept absolutely. There is nothing to argue about here; even our foreign colleagues agreed with this. We asked them about their impressions after the visit to Tomsk-Seven. READER'S DIGEST correspondent James Dorsey said:

"I was struck by the very concept of a 'secret city.' Not a plant, that one can understand, but an actual city, where people live. Many people. The state has appropriated the right to run their personal lives, it has limited their interaction with other people, even with friends and relatives. For what? Is secrecy at the plant not enough?"

Incidentally, the combine specialists offered us explanations on this point. One said something to the effect that a production unit of this specific kind is obliged to have the usual buffer zone to protect public health, and the city inadvertently happened to fall within this zone. Another reassured us that this specific production unit represents a substantial potential danger (it is difficult not to believe him) and for this reason careful protection is needed.

However, there is another aspect of this important problem and that is psychological. The same James Dorsey was simply flabbergasted when he talked with a lady doctor:

"I asked whether she thought that her freedom was limited in this city. The answer: 'No, I hadn't thought about it.'"

"And do you know," we asked a colleague, "that in this city a referendum was held and the overwhelming majority of residents favored having the city remain 'closed'?"

"Yes, I know and I understand these people to some extent. At present they have a standard of living which is quite a bit higher than in other cities; there is more

cleanliness and order, and there is less crime... Nonetheless, this is terrible because it leads to the atrophying of dignity and the natural human craving for freedom."

It should be recognized that for us this is not the most common view. It is a view from off to one side, so to speak. But has the time not come to think about it?

During this time rumors were going around about an agreement between the Tomsk nuclear specialists and the French. The latter came, at first unofficially, to Kemerovo, Tyumen, Novosibirsk and other cities. The French, who are supposedly very scrupulous about ecological matters, "wisely" decided to send their radioactive wastes to us, specifically to Siberia. When the content of the negotiations was revealed, it became clear what the discussion was about. At the meeting with the combine's specialists we were told directly: "Precontract negotiations are being carried out on whether we will take for supplemental enrichment regenerated uranium from French nuclear power plants." Supposedly this will not involve any additional burials or wastes. Is this really raw material for subsequent conversions? Is that really so? The technology and conditions of production at the Sibkhimkombinat remain highly secret. And this means that, despite all the reassurances, we will suspect the nuclear workers again and again of ignoring our environment and our health.

#### **Yakut Diamond Factory To Close Due to Pollution**

*LD0309084591 Moscow KOMSOMOLSKAYA PRAVDA in Russian 30 Aug 91 p 2*

[INTERFAX report under general heading: "Have You Heard? Have you Read?"]

[Text] The Yakut Council of Ministers has decided as of 1 January 1992 to close one of the four factories of the Yakutalmaz association. The reason is the pollution of the environment by the factory's industrial effluent. At present the above-mentioned four factories provide 99 percent of diamonds.

#### **Political Prospects of Ukraine's Green Movement Assessed**

*91WN06562A Kiev KOMSOMOLSKOYE ZNAMYA in Russian 30 Jul 91 pp 4-5*

[Article by KOMSOMOLSKOYE ZNAMYA contributor Valentin Smaga: "He Who Is Late Growing Up Ages Soon: Polemical Notes on the Shining Reputation and Destitute State of the Ukrainian 'Greens'"]

[Text] On the day our wishes were realized, I felt a dark sense of foreboding. It seemed to have really happened. At last, a Ministry for the Protection of the Environment had been created in the Ukraine. It seemed to be really true! The new minister was not simply another losing hand in a game of Patience dealt by the nomenklatura. He was Yuri Shcherbak, a well-known writer and scholar, USSR

people's deputy, and chairman of the ecological association Zelenyy Svit [Green World]. There is no need to introduce Yuriy Nikolayevich to readers of KOMSOMOLSKOYE ZNAMYA, which carried extensive interviews with him on 15 March and 25 May of this year. As a true democrat, the leader of the Ukraine's "Greens," as soon as he became minister, issued a statement asking to be relieved of all positions of leadership that he held in the ecological movement. It should be obvious to everyone, however, that the success of his activities will depend in large part not just on his own efforts but on the extent to which the public pressure applied by the movement of the Ukraine's "Greens" can be renewed. The "informals," so to speak, are going to have to help the "formal" officeholder. We have never had such a person in power before.

#### **Position and Opposition**

In my judgment the Chernobyl explosion marks the start of the ecological movement in the Ukraine. In its aftermath many people have at last come to realize that our common home—nature—is dying, and that there is no point in relying on the support of the state—that only we ourselves can save it.

When the children of Cherovtsy grew bald, the Green Movement of Bukovina arose, headed by Leontiy Sandulyak. When the population of the resort city of Cherkassy started choking, Comrade Yuriy Vysochin bravely rose to the defense of the local children's health. At any moment a catastrophe may occur in Dneprozerzhinsk, where antiquated equipment has been emitting phosgene gas (a toxic substance that goes back to the days of World War I). Here, fellows from Serhiy Konayev's Ekologicheskaya Initsiativa [Ecological Initiative] have taken to the streets. The Dnestr is dying, but joining the battle for the life of the river are the Vechernyaya Odessa Ecological Club with Lyudmila Sokolovskaya, Alla Shevchuk, and Ivan Rusev among the most active participants. After the atomic energy department of the Zaporozhye AES [nuclear atomic power station] brazenly released radioactive nuclides from its refrigerant reserve directly into the Dnepr, a group of social activists in Nikopol headed by Vyacheslav Sandul sounded the alarm. An outrageous scheme to build a new railroad junction in Kiev prompted the formation of a group called Nebayduzhi [The Committed Ones] headed by Viktor Chernenko. And plans to extend the South Ukraine AES have led to the appearance of an organization of Greens under the leadership of Viktor Bilodil.

I know all these people personally, having written about them more than once, and I can state without reservation that this movement of so-called "informals" and "extremists" arose as a direct response to the rotten formalism and bureaucratic apathy of the official environmental protection hierarchy. These groups have developed among themselves purely humanitarian traits, such as social conscience, organizational skills, and a concern for the damage done to their native land—

qualities which, one might have supposed, had been extinguished once and for all in people by the system of barracks socialism.

Still, it is appropriate to mention that the activists of regional organizations created the Zelenyy Svit association primarily for the purpose of being able to resolve more successfully their own specific problems. In addition, the Greens movement from its very inception included progressive scholars and popular figures in the arts. The association's first chairman was Serhiy Plachynya. The names of the writer Yury Shcherbak, director Yuriy Mishchenko, academician Dmytro Hrodzynsky, and Sergey Doroguntsov, who is chairman of the Ukrainian SSR Academy of Sciences Council for the Study of Productive Forces in the Ukrainian SSR, do not require biographical detail.

At the founding congress of the association, it became evident once and for all that a union of the conscience, intellect, and social activeness of delegates from all regions of the Ukraine would be capable of making Zelenyy Svit a potent force. But what kind of a force? A political force or a purely social force?

Attempts were made to turn the Greens into another version of the bureaucratized Ukrainian Society for the Protection of the Environment. Viktor Rybachuk, head of the Ukrainian CP Central Committee Ecology Department, for example, showed up at one meeting with a home-made slogan for protecting the environment. The first secretary of one of the rayon party committees in the capital loudly proclaimed from the congress rostrum that the staff of his party committee in its entirety was joining Zelenyy Svit.

The first secretary's words were met with wry misgivings. On one side, a fruitful idea of the association was to invite the cooperative efforts of all social forces, from the secretary of the oblast committee down to the village elder, in the interest of the common goal. After all, we all have in common the survival of our native earth, however much we may differ. From another standpoint, however, the Greens activists like all other growing social forces were propagating their views ways most available to them—as critics of those in power. In a strange way, this criticism of the "apparatchiks" and the "party Mafia" reflects at once the strength and weakness of the Greens.

The ability to reconcile contradictions is one of the true signs of a leader. It is by no means accidental that Yury Shcherbak was chosen to be chairman of the association. The moral victory he achieved by documenting the Chernobyl disaster in a book, his productive efforts on the Ecological Commission of the national parliament, and the wisdom he demonstrated in making his appearance at a critical moment in the founding congress, which had threatened to turn into a humdrum meeting, presented persuasive arguments in his favor. The debate that began at that time regarding the degree of politicalization in the movement has not yet died down. Behind

these theoretical arguments, in my judgment, is a common desire to draw the leader of the movement, Yury Shcherbak, over to one's side.

The arguments of some are as follows: The party (a word, by the way, which means a part) should have a social base and should subordinate all its activities to a concerted struggle for power.

Serhiy Hrabovskyy, a philosopher and columnist for the newspaper ZELENYY SVIT, puts it this way:

"Show us a person who can solve a single ecological problem without politics and we will put his picture on the front page for an entire year."

Yes, indeed, the key problem of survival is political. Still, the subject has not always been of interest to supporters of the Greens. When the movement was organized, the "matryoshka principle" came to prevail; that is, within the larger, politically diverse association of Zelenyy Svit there appeared a smaller party of the Greens of the Ukraine, and when that happened, it became difficult to coordinate the efforts of regional groups. Naturally, the apparatus of the association, which was supposed to deal with this problem, consisted of people who were utterly unprepared for such a task. This apparatus, in my view, made a whole lot of childish mistakes which are to be paid for at considerable expense. As the French say: "He who is late growing up ages soon."

#### The Koba Syndrome

Serhiy Fedorynychyk demanded on the telephone: "Give up your mandate!"

"What mandate? What is the matter with you? One might think we were working on an Extraordinary Commission and not in Zelenyy Svit."

My sin consisted simply of wanting to help the association conduct an independent study of the causes of the Chernobyl disaster. I published information about this work without getting it "cleared." I could not help but suspect that my old friend, now in the office of Zelenyy Svit, had changed beyond recognition.

Or take this instance. Not long before the congress, some of the members of the association's Audit Control Commission prepared a summary report on its financial management. One member of this commission, however, had not taken part in this work. He familiarized himself with the document at the congress, and then categorically refused to sign it. Thus, from a legal standpoint, the report did not even exist (although a good deal in it expressed grave misgivings about the fate of the movement). As researchers and journalists who must answer for their words say, it was still not "established fact."

Even before the congress convened, however, everything was in a state of commotion. An article based on the summary report appeared in the pages of RABOCHAYA GAZETA. Not to be outdone, PRAVDA UKRAINY

carried it, too. Even the central press joined the campaign. The Moscow newspaper EKONOMIKA I ZHIZN reported on it. Then, on the day of the opening of the second congress of the Greens in Ivano-Frankovsk, RABOCHAYA GAZETA with enviable coverage came out with a collection of reader responses, featuring an article by Viktor Chernenko, a former leader of Nebayduzhi and presently a deputy of the Kiev City Council.

Now even if this summary report, upon which the campaign that was launched against the Greens was based, were irreproachably honest in its intent—even if everything in it was true—persons concerned for the future of the movement, for reasons of moral principle, should not have acted in this way. And the highest-ranking body of the association is the congress. It is the congress that bears primary responsibility for resolving such matters. Notwithstanding this campaign of vilification in the party press, however, the resolution on this issue was worded as follows: “To declare the work of the Audit Control Commission unsatisfactory in failing to reconcile the views of its members.” One hundred fifty-six delegates voted for the resolution; only 18 voted against it. I think that the reason for the fiasco on the part of those who instigated this persecution of the Greens is attributable to a phenomenon that has become widely recognized—the so-called “effectiveness” of the party press. The more it criticizes its opponents, the more popular these opponents become.

Incidentally, a sociological survey confirmed the fact that following the smear campaign in RABOCHAYA GAZETA, the party of the Greens received one of the highest ratings of trust among all political factions in the Ukrainian capital. So the Greens have the press to thank for this free publicity. In the final analysis, however, this is a mere detail. The main point lies elsewhere. Although he was aware of the resolution adopted by the congress, Viktor Chernenko gave an interview to the newspaper MEGAPOLIS-EKSPRESS reiterating the same allegations. According to the testimony of Nikolay Vengerskiy, an official of the Ukrainian SSR State Ecological Committee, staff members of the committee distributed this very material among the deputies of the Ukrainian SSR Supreme Soviet on the eve of Yuriy Shcherbak’s election as minister.

Viktor Chernenko is undoubtedly free to express his views when and where he pleases—that is his right. But does this undoubtedly sincere politician not realize how heartening this unprecedented discontent is to other office headquarters those of the Greens? They have been fabricating charges, which burst like soap bubbles, about Levko Lukyanenko’s home having been purchased with public funds and Dmytro Pavlychko’s purported cooperation with the KGB.

God help them and their offices. Our concern is with the movement of the Greens, in which, as we can see, a vulgar squabble is now underway. And there are those among us who are masters at fishing in muddy waters.

You may recall what the illustrious Koba, Iosif Dzhugashvili, made out of the ideas of the party of the Bolsheviks after taking over initially the rather modest duties of managing the party apparatus. The laws of bureaucracy are everywhere the same, and whether one is Left or Right, red or green, does not alter them in principle. Ruslan Khasbulatov, first deputy chairman of the Russian Parliament, has aptly described this by saying that just as cancer cells are present in any healthy organism, so the Koba Syndrome, as he calls it, is to be found in any social organization in which are those who put personal goals above loudly proclaimed public interests.

#### Overwhelming Majority and Disintegrating Minority

On the ring of Archimedes were written the words: “A small failure is better than a small success.” After the second congress of the Greens in Ivano-Frankovsk—however strange this might appear—people felt confident of achieving full and final victory. Some because Viktor Chernenko and Serhiy Fedorynych had not managed to get into governing bodies of the Greens; others because they felt they had taken a position and stood up for their views. But was this the case?

I asked Viktor Chernenko: “Why did you not print your article in the newspaper ZELENYY SVIT?”

“They will not print what I write for any reason.”

I inquired of Serhiy Fedorynych: “And what are you doing now?”

“Nothing. I am without work.”

Shutting up the mouths of those who dissent and isolating non-conformists....Whose methods are these? And why is it that the official report by the chairman of Zelenyy Svit was followed immediately by elections for the leaders? Was there really nothing to discuss?

I believe in the personal integrity of those who stand “accused.” But there have been mistakes, occasioned by a lack of experience and excessive enthusiasm. A rigorous and thoroughgoing analysis of these mistakes would serve as an excellent lesson in management. There is no reason to fear decent people. And we do not need any people in the Greens who are not decent people. But no! There was fear of a scandal, and it was preferred to suppress it by driving it deeper inside. So it is, my brothers, that we may inadvertently wind up as the “vanguard,” which from time immemorial has been made up of an overwhelming (etymologically, a “crushing”) majority and a minority suffering from the ill effects of wounded vanity.

All this we have already gone through. But the most lamentable thing is that the present state of the Greens should be disillusioning to people who, in some cases, struggled selflessly to protect nature before there was so much as a trace of the so-called restructuring. Consider the statements that follow.

Danylo Kulynyak, writer and member of Zelena Rada:

"I think it is easier to stage a farcical funeral with a mock-up of the Chernobyl AES in Kiev than it is to achieve the closing of a regional factory that is poisoning people. I realize that it is pleasanter to roll into Belgrade than into Bolgrad in the Odessa region, a proposal I have made repeatedly; for it is situated along the coast of the polluted Yalpuok River and dying without fresh water. The indifference of the Greens in such matters makes me keep my distance, although I have been working in the movement to protect the environment in the Ukraine for 20 years, during which time I have written two books as well as hundreds of articles and have arrested hundreds of people for poaching."

No less instructive is the opinion of the chairman of the ecological commission of the Nikopol soviet, Vyacheslav Sandul, who is also a member of Zelena Rada:

"The congress was necessary, and it is a good thing that we met in Ternopol. Previously, we came to Kiev, and instead of getting down to business, we would listen for hours to bickering of the kind that one encounters in the capital. I am in no hurry to become a member of the party of the Greens, although it may be necessary to do so in time. As an association representative, there are five hundred people to help me at a factory; whereas as a member of a party, even an ecological party, there are no more than a dozen or so. Generally, the help one may expect from the governing bodies of Zelenyy Svit is rather small. I place all my hopes for improved conditions on the election of Yuriy Shcherbak as minister."

That is, it is easiest for us to believe in a tsar or some all-powerful surrogate. And the simplest thing is write letters of appeal. Petitioners in droves are now appealing to the new minister. Here, perhaps, are the themes of some of them.

The "green" ecological commission of the Odessa Oblast soviet has utterly and completely failed to dislodge from power the thoroughly discredited chairman of the oblast committee who belongs to the nomenklatura. Residual refrigerant from the Zaporozhye AES is being regularly discharged into the Dnepr near Nikopol. The USSR Ministry of the Fishing Industry has thought up the idea of selling licenses to fish in the damned lakes of our sovereign Ukraine. And the Ministry of Forestry Industry is brazenly attempting to take over the former Crimean Hunting Preserve for the use of the aristocracy of the nomenklatura.

When such outrages were looked upon with equanimity by the head of the state environmental protection service, an offshoot of the Goskomselkhoztekhnika system, it was understandable. But if the new minister, who is extraordinarily popular in the ecological movement, does not become involved in local conflicts such as these, he risks losing his reputation. And Yuriy Shcherbak is not God Almighty. He cannot do everything at once. Deliverance can come from no one but ourselves.

Let us therefore be realists. Let us put an end to this wretched contest of vanity that threatens to tear Zelenyy Svit to pieces. Let us back Yuriy Shcherbak with the full force of the ecological movement! And there is a good mechanism for this purpose. We need only revive the social council of the former State Ecological Committee and give it the authority to exert a direct influence on the new ministry. Then the impact of the Greens on state decisions will be guaranteed.

The present situation offers the Greens of the Ukraine a precious opportunity. We must not let it slip by. The time has come to support the efforts of the same government department that we have found so easy to criticize. For without such support, we cannot survive on this earth of ours. But does everyone understand this? I am not convinced that they do.

And that is why I felt a sense of foreboding on the day our wishes came true.

#### **Moldova, Romania Sign Environment Protection Agreement**

*AU0609173591 Bucharest ROMPRES in English  
1549 GMT 6 Sep 91*

[Text] Bucharest, ROMPRES, 6/9/1991—A "Convention for Cooperation in Environment Protection" was signed in Bucharest between Romania and Moldova by the environment ministers of the two countries, Valeriu Eugen Pop and Ion Dediu respectively.

The convention covers joint tackling of ecological problems on local, regional and global scales, including integrated monitoring, extension of protected areas, capitalization of energy resources and wastes by developing new technologies, radio protection and nuclear security.

#### **Estonians, Latvians Training in Finland for Ecology Careers**

*91WN0642C Helsinki HELSINGIN SANOMAT  
in Finnish 26 Jul 91 p 9*

[Unattributed article: "Baltic Youths After Ecological Know-How"]

[Text] "We are not interested in an American-style market economy. That is only a society of senseless waste," says Veiko Kivi, who is in forest-soils research at the Estonian Agricultural Academy in Tartu.

"It is extremely important that Estonians obtain and can then spread information about both the good and the bad aspects of capitalism," he continues.

Kivi is a grass-roots activist who is at present in Finland as a guest of the Helsinki University Student Body (HYY), Environmental Issues Division, to get training to be used at an environmental information center that will be established in Tartu.

Many obstacles still stand in the way of implementing this endeavor.

"It is tough to implement this center because we lack facilities in Tartu," says Kivi in summarizing the material aspects that relate to it.

Estonia does need the center because the republic is struggling with immense environmental problems. Veiko identifies the oil shale region in northeastern Estonia as the worst single problem.

Estonia's southern neighbor, Latvia, has its share of ecological catastrophes.

"Wastewater treatment plants are virtually unknown in Latvia. All wastewater enters the Gulf of Riga in its unaltered state. Fortunately, we have less air pollution than does Estonia," observes Latvian Inese Lapa.

Both republics are affected by an acute shortage of Western currency with which to purchase technology.

Lapa is also in Finland to learn more about environmental issues. She is a member of the Latvian Environmental Protection Club (VAK).

In Latvia, VAK is pioneering the concept of citizen's organizations. It was established in 1987 and, as a legal entity, also acts as a blanket organization for dissidents and people who favor alternative ways.

"Once things became more liberated, people established organizations based on their own interests, and VAK is now a sort of umbrella for them," says Lapa.

VAK has close ties to the Greens, and cooperation is smooth between them.

Lapa observes that information flows both ways between the Greens and VAK on one side, and the environmental affairs committee of the Supreme Soviet on the other.

"Latvia has no environmental ministry, but, during this interim period, the active organ is a committee concerned specifically with environmental issues. This committee is directly subject to the Supreme Soviet. This keeps the bureaucracy smaller."

Lapa adds that the World Nature Foundation has significantly helped the committee.

Kivi says that, in Estonia, the ties between citizens' organizations and the Greens are weak. "Besides this, the Estonian Greens have split in two and do not have much influence," he explains.

Kivi himself is not a member of the Greens and has little to do with them.

The same increase in environmental awareness, called "Greening," that is familiar in Finnish politics has also been a development within Estonia's other political parties. In Estonia, some of the parties truly are trying to

pay attention to ecological factors. In Latvia, on the other hand, parties have been quick to learn Western vote-gathering techniques.

"Political parties start 'Greening' at just the right time before elections," smiles Lapa.

Connections are weak between citizens' organizations in the Baltic republics and those in Russia. The organizations seek to get training primarily in the Nordic countries and Germany. Estonians focus on Finland even just because of the language. Latvians, on the other hand, focus more on Sweden.

Germans have participated in environmental projects in Latvia and are bringing know-how. Latvians who have emigrated to the United States have helped organize a "Green library" in the republic.

The HYY environmental division has the ambitious objective of obtaining technological equipment such as computers and audiovisual apparatus and then sending these to Tartu.

Estonian environmental activists are currently compiling the first ecological guidebook in the Estonian language.

#### Archangelsk Area Environmental Problems Reviewed

91WN0642B Helsinki HELSINGIN SANOMAT  
in Finnish 26 Jul 91 p B 1

[Article by Sole Lahtinen: "Pulp and Paper Factory in Archangelsk Trying To Follow Finnish Plan To Reduce Emissions"]

[Text] Archangelsk—Vladimir Koshkin, an engineer at the Solombala Pulp and Paper Complex, knows what he wants to do: remodel his factory near Archangelsk according to a Finnish plan.

The plan, authored by the Jaakko Poyry consulting firm, was finalized in April. Koshkin uses graphs to show how production efficiency will improve and the release of pollutants into the watershed will decrease, if only sufficiently interested partners can be found. "The total cost of the remodeling will reach 350 million rubles. The complex cannot afford that."

There are as many as three big cellulose complexes on the Archangelsk side of the Dvina River watershed with more on the Komi side.

The quantity of cellulose industry pollutants entering the watershed is the greatest anywhere on the globe, say environmental officials in Archangelsk. The White Sea fishery has suffered a decrease in numbers. The water in the Dvina River is unfit for swimming but water is still taken from it for purification into drinking water. The health of people living in the area is poor.

Only now are efforts to protect the environment and the population being initiated, but this is still a more vigorous effort than what is being done in surrounding areas, says Archangelsk Environmental Bureau director, Vasily Afanasyev.

The city has gained a new research institution. The mutual organization of the forest industry, Severoles, has established an environmental department. The environmental movement has organized itself to resist plans for a thermonuclear power plant.

All of the wastewater at Koshkin's place of work, Solombala, is treated. The thickest goo is held in an artificial pond and filtered through an earthen wall before being released into a Dvina tributary.

Sticky gobs of foam float on the surface of the murky tributary toward the sea in a watershed that has water unfit for drinking, swimming and fishing. The smell is not strong enough to be mentioned.

One in six cellulose boilers is being remodeled at this time. And, indeed, some of the machinery is so old it is ready to fall apart at any time. Inside the factory there is a fairly modern Swedish production control system.

#### Crash of Ruble Puts New Equipment Out of Reach

New equipment has been ordered but the ruble is not always accepted as the currency for payment. And if purchases are to be made using foreign currency then the prices soar out of reach due to the vertical plunge of the value of the ruble.

This factory on the edge of town is one of three branch factories in the Solombala complex. The complex employs 5,000 workers with this factory having 3,500 of these. "That is approximately as many as by the pulp industry in all of Finland," Koshkin points out.

The factory, built in 1935, has been expanded. Annual production now is 288,000 tons of cellulose. Once the Poyry Co. plan is implemented production will increase by 60,000 tons. Previously two-thirds of the production went abroad. Now, in the perestroika years, about one-half of production is exported.

Environmental officials and the recently organized environmental movement are in favor of expansion plans that take environmental concerns into consideration, says the chairman of the executive committee in the Arctic area, Marina Belogubova. She is also active among the leaders of the "Northland Ecology" movement.

About 23 million cubic meters of timber will be felled in the Archangelsk Oblast this year. The peak harvests reached 28 million cubic meters. Soviet machinery is only capable of operating in clear cut situations, complains Belogubova, who is a specialist in environmental economy.

The felled wood is transported by water, thereby polluting the water. People in Archangelsk are envious of the situation in Finland where the transporting is done over land.

Nevertheless, Belogubova is optimistic since the timber harvest has been scaled down. "On the long term that means greater overall production."

#### One of 100 Most Polluted

Sulfur emissions by the Solombala factory are about 21,000 tons per year and that is one-sixth of the emissions of the city of Archangelsk, says Koshkin.

Industry's share of air pollutants in the Archangelsk district adds up to more than 600,000 tons annually, according to official sources. Emissions come from six power plants, chemical and weapons factories. This amount is almost double all of Finland's emissions but still merely comparable to those of the city of Narva, Estonia.

This year the city of Archangelsk has been placed in the horror gallery of the 100 most polluted cities in the USSR. Back in 1988, when the taboo on talking about environmental issues crumbled, the city was rated as one of the 64 worst polluted cities.

This means that the situation has deteriorated more rapidly in some other places. The chief concern of the populace currently is probably water pollution. The sewage of the cities is dumped into the river which, nevertheless, supplies the drinking water. Only half of the sewage of Archangelsk, a city of 400,000, is treated. All drinking water must be boiled because of the high concentration of fecal coli bacteria.

#### Why Did the Starfish Die?

Last summer the people of Archangelsk were frightened by the massive die-off of White Sea starfish. Rumors had it that radioactive components of old submarines or old containers of lethal, wartime gases had been dumped into the sea and these were now the sources of the murderous substances.

Vladimir Kozlov, director of the Environmental Research Institute, says that preliminary studies have not indicated radioactivity. Researchers from the science academy are continuing investigations of the die-off and there are hopes that they will have a report ready in the fall.

During the 1950's and 1960's it was legal to dump military waste material into the White Sea. Investigations are not easy to pursue.

A biologist who studied the White Sea during the 1930's says that the process leading to the death of the sea began long ago. "The first sign was the thinning out of the seaweed. There have been massive die-offs of the starfish before but it was not permissible to talk about them."

Protecting the fragile, northern environment of Archangelsk is made more difficult by the presence of big military areas. Stories in circulation elsewhere tell about Soviet army bases that have wastefully released fuel into the environment.

Restricted areas around Archangelsk include a nuclear submarine factory, testing ranges for rockets and a nuclear test area. It is difficult for local officials, and much more so for environmental activists, to gain entry into these areas for the purpose of taking measurements.

The law already permits the fining of a factory that is polluting the environment but there is no guarantee that the fines will be paid. Environmental officials in Archangelsk have levied 11 million rubles in fines over a period of two years. Less than one million has been collected.

#### Finnish Experts Examine Lake Ladoga Basin Pollution

91WN0690A Helsinki HELSINGIN SANOMAT  
in Finnish 16 Aug 91 p 9

[Article by Johanna Mannila: "Finnish Environmental Experts Visit Increasingly Polluted Lake Ladoga"]

[Text] Lake Ladoga is sick, and it shows. Eight Finnish experts in water preservation—along with managing director Kaj Barlund—took a look at the foaming wastewater of the Svetogorsk chemical pulp factory, the water purification methods at a giant piggery, a chemical pulp factory as old as Adam, as well as Valamo and the Sortavala islands during a fact-finding tour that lasted from Monday to Wednesday.

The visit was linked to a Finnish-Soviet water preservation agreement to be signed this autumn. In the agreement, Finns and Soviets specify emission reductions and protective measures to be employed. Efforts will also be made this autumn to overhaul the 16 worst polluters located near Finland. The factories' problems are listed in order of importance, and a report will be submitted to Minister of Environment Sirpa Pietikainen (Conservative Party) the first week of September.

There are 700 industrial plants and roughly the same number of farms in Lake Ladoga's catchment basin. Purification of wastewater is either nonexistent or inadequate. Everything conceivable runs into the lake: solvents, pesticides, heavy metals, residential sewage, and chemical pulp factory wastewater.

Vladimir Rumjantsev, director of the Lake Ladoga Institute, says the lake's condition grows worse all the time, even though sewage treatment plants have been built. "Since the 1960s, more and more nutrients have ended up in the lake. Eutrophication is seen as growth on the lake's surface. The fish are sicker than ever."

#### Drinking Water Threatened

"The situation is definitely worst on the southern side of the lake," says Rumjantsev. Pollution is evident, for example, in seal pups whose skulls do not ossify properly because of poisons in the water.

Leningrad gets its drinking water from Lake Ladoga, and there will be big problems if the lake continues to be polluted. Leningrad has no other sources of drinking water.

"The Pitkaranta chemical pulp factory is the worst, but the others are not much better," says Rumjantsev. Soviet environmental officials are ready to raze the Laskela and Pitkaranta chemical pulp factories on a moment's notice.

Rebuilt by Finns in the 1970s, Svetogorsk is modern compared to other chemical pulp factories in Soviet Karelia. Wastewater is purified satisfactorily, believe Finnish experts, by a biological process at the sewage treatment plant. Saturated with sulfur, the air around Svetogorsk may improve during the next few years. Heavy fuel oil will be replaced by natural gas in 1993, according to factory directors.

#### Karelian Isthmus Gets Large Nature Park

"In a couple of years half of the Karelian Isthmus—some 300,000 hectares—will be part of a nature park," says Vladimir Bistrov, deputy chairman of the Vyborg city council. The land there may be cultivated—but under strict regulation.

According to Bistrov, the worst environmental problems of the Vyborg area and the Karelian Isthmus are tied to tourism, industry, and agriculture.

"Half the people of Leningrad spend their summer vacation on the Karelian Isthmus, and the environment can't take it. Too many chemicals that end up in Lake Ladoga or the Gulf of Finland are used in intensive farming."

In Vyborg the situation is worst in the bay that confines the Papula bridge. Eleven companies dump their unpurified wastewater directly into the bay, and two bridges prevent the water from flowing into the bayhead. "On warm summer evenings, when waste from the meat processing plant rots on the water's surface, you can pick up the stench all the way downtown," says Bistrov.

The wastewater problem will be solved by a new drain that conducts water to the treatment plant. The drain is supposed to be ready by 1993.

#### Finland To Finance Environmental Projects for Estonia, Karelia, Leningrad

LD0609104991 Helsinki Suomen Yleisradio Network  
in Finnish 1500 GMT 5 Sep 91

[Excerpts] [Announcer] Finland will participate in financing 16 environment protection projects in Estonia,

the Leningrad region, and Karelia. Following this, air pollution in southern and eastern Finland will decrease substantially over the next 10 years. The pollution load in the Gulf of Finland will decrease to almost half the present level. Jaana Kanninen reports:

The ministry of the environment published today the first extensive report on the state of the environment on the other side of Finland's eastern border, a joint study conducted by five consultants. In the study, the regions of Estonia, Leningrad, and Karelia were examined. The report notes there are in the region 60 environmental problems that are so bad, each of them should be tackled speedily. Most of these problems are known, but there are new causes of concern, too. Project director Timo Maekelae from the Ministry of the Environment:

[Begin Maekelae recording] Hazardous waste in Leningrad is a matter about which we have received new alarming information. In other words, in Leningrad there is a situation whereby hazardous waste has been taken to a refuse dump. The dump has been ordered to close. In practice this means that if a plant for dealing with hazardous waste is not built, the waste will spread into the environment. The Matter is really urgent. [end recording]

[Kanninen] Finland has chosen 16 environmental protection projects, and will help with the financing. It has

been judged that the most urgent cases are the reduction of sulphur emissions from the Narva bituminous shale-fired power stations and the purification of the waste water in Leningrad. In addition, Leningrad will receive help as soon as this year to acquire oil-fighting equipment; Tallinn will receive help in the purification of waste water. Finland will also participate in removing sulphur at the Kostamus plants. Details for all these projects have already been agreed. [passage omitted]

The focus of the environment cooperation will be in the protection of the Baltic, and in air protection, that is, in areas which will also give the biggest possible benefit for the environment in Finland. If, and when, all 16 projects have been implemented, it means that pollution discharges in the Gulf of Finland will decrease by about 40 percent from the present level, as Leningrad and Tallinn are the worst polluters of the Gulf of Finland. The reduction in sulphur emissions in Estonia and Karelia, for their part, will be directly reflected in Finnish air protection. It is estimated that the sulphur fallout in southern and eastern Finland will decrease by 10-20 percent from the present level.

[Announcer] Implementation of the entire cooperation program will take at least 10 years. It will cost 15 billion Finnish markkas, of which about one third will be financed by foreign aid and credits, and two thirds by local Estonian and Russian funds.

## REGIONAL AFFAIRS

### EC Regional Planning Program on Urban Environment Summarized

91MI0394X Wuerzburg *UMWELTMAGAZIN*  
in German Jun 91 p 96

[Text] "Europe 2000—Prospects for Future Regional Planning in the Community." This is the heading under which the European Commission in Brussels is tackling the urban environment. It is obvious that dirt, which knows no frontiers, can no longer be allowed to continue building up or being tipped into watercourses. But Brussels has made one thing clear: All it can do is lay down general guidelines for the Community, like those it has just issued on the treatment of urban sewage. Environmental legislation is not subject to the exercise of centralized power: By the end of this year, a draft bearing the title "Europe 2000" is to be circulated to all 12 member states. It will take the form of guidelines drafted with the participation of regional and local authorities.

The EC Commission has already issued a preliminary report on regional planning for the year 2000. The aim is to achieve an "efficient regional policy with a clear conception of the future shape that the whole Community area is to take." The following priorities are identified:

- The need to develop a network of links between cities to strengthen contacts between them and make full use of existing complementary laws, taking particular account of peripheral regions;
- The importance of developing rural areas, in which traditional, predominantly agricultural, activities are encountering increasing difficulties;
- Assessment of the longer-term socioeconomic effects of the population explosion in non-EC Mediterranean countries and the consequences for European Community policies;
- In direct relation to the previous item, the increasing influx of foreign immigrants, including those from eastern Europe;
- The socioeconomic effects of the growing proportion of old people in the population of EC countries.

The above represents only a small proportion of the topics to be addressed. The effects of population concentrations are already well-known. In addition to urbanization, the development of rural areas, and transport networks, other matters requiring urgent discussion and assessment in terms of their impact on the environment include power supplies, the transition to renewable sources of energy, environmental quality, and the problems of the coastal areas, which are dependent on fishing (and also "overfishing").

Environmental quality concerns not only such familiar matters as the high level of air pollution in the industrial conurbations ( $\text{SO}_2$  and  $\text{NO}_x$ ). Other topics include water

source and supply problems, water pollution, soil erosion, especially in the Mediterranean region, soil pollution in industrial areas (especially in eastern Germany and eastern Europe) and the pressures of competition on land use in coastal areas, where insufficient controls lead to environmental damage.

Certain aspects that are frequently passed over will be specifically addressed in Brussels, such as the endangering of our natural heritage of fauna and flora. The area covered by the European Community is marked by an environment of great diversity, with the south being richer in species than the north. For instance, the Alps alone possess as many species of plants as the whole of Great Britain, while 60 percent of flowering plants and 70 percent of mammal and amphibian species are native to Italy.

The members of the European Environmental Agency have already presented their "White Paper for an EC Ecological Economic Policy." This also stresses the European Community's responsibility for drawing up outline rules on ecological controls, minimum standards for emissions, basic principles for realistic attribution of costs to firms, minimum criteria for approval procedures, environmental compatibility tests and entitlement to consultation, ecological criteria and procedures for environment-oriented regional planning, and product standards imposing minimum safety requirements. The individual states must however retain the right to improve on these European standards, since "town councils and regional governments form the most important level for implementing ecological concepts."

### 'Green Charter'

Under the auspices of the International Chamber of Commerce in Rotterdam, 200 of the world's leading industrial firms and other business organizations have just committed themselves to the "Green Charter," which aims to establish a rational link between environmental protection and economic growth. The signatories include numerous multinational companies, including automobile and chemical manufacturers. They intend to subject every new business activity to a prelaunch environmental compatibility test. Except for Turkey and Taiwan, all the signatories are from western Europe and North America. The Japanese are not among them.

### EC Draft Directive on Ozone Pollution

91WS0466X Brussels *EUROPE* in English  
3 Jul 91 p 11

[Unsigned report: "EC/Environment: The European Commission Has Submitted a Directive to the Council Over Air Pollution by Ozone"]

[Text] Brussels, 02/07/1991 (AGENCE EUROPE) - The European Commission has just submitted to the Council a draft Directive on the pollution of the air by ozone ( $\text{O}_3$ ), more precisely the tropospheric ozone, that is the ozone found in the layer just below the atmosphere. The

Directive which the Commission would like to see come into force on 1 January 1993, has three objectives:

- 1. Set up a framework to control the concentrations of ozone by setting up or completing measuring networks. In the EC, measuring ozone concentration is recent and far from being applied throughout the Member States;
- 2. Set up a system of information exchange between member States, the Commission and the future European Agency for the Environment (EAE) allowing for greater knowledge of the problem;
- 3. Guarantee information to the public in case of situations where the ozone level could present risks to health, through a system of alarm. The thresholds set down in the Directive are reference levels corresponding to the requirements for health and vegetation protection conforming to WHO [World Health Organization] recommendations.

The Commission's approach is a two step approach: the proposal provides for a second stage, after five years of the alarm procedure being in operation, in which it will be possible to set binding limits to be respected throughout the Community. Currently, our knowledge does not allow us to set objective and binding limits for ozone concentration in the air. This is why the first stage aims to set up several Community actions which will enable those concerned to widen their knowledge of the problem and limit the consequences of high concentration of ozone for human health.

The proposal comes in the context of different EC actions in the fight against atmospheric pollution by oxidizing photochemicals of which ozone is a main component. This type of air pollution is considered to be one of the major problems for the environment in the years 2000. Concentration of photo-oxidising agents in general and ozone in particular, notably due to exhaust emissions, is worrying as it has a negative effect on human health (irritation of the eyes, headaches, breathing difficulties), nature (slow-down or perturbation in vegetable growth) and materials (degradation of buildings etc.)

#### **EC Preparing New Directive on Packaging, Packaging Waste**

*91WS0491T Brussels EUROPE in English 25 Jul 91  
pp 13-14*

[Unsigned report: "(EU) EC/Environment: European Commission Studies Need for New Directive on All Packaging and Packaging Waste as Part of Its Global Strategy"]

[Text] Brussels, 24/07/1991 (AGENCE EUROPE) - The services of Commissioner Carlo Ripa di Meana are now working on a completely new draft Directive on packaging and packaging waste. The main points of this initiative were presented in a Communication on the "Implementation of the Community strategy for waste management of package and packaging waste." This

document presents the problem with emphasis on the necessity, in light of a successful internal market, of a Directive on all packaging and packaging waste to replace the 1985 Directive on the packaging of liquids for human consumption. The Commission took note of the Communication and is awaiting the draft Directive, which should be finalised by the end of the year, before taking a formal stand.

Therefore, Mr. Carlo Ripa di Meana is hoping that the Council will adopt the Directive, the scope of application of which would be valid for all packaging and all packaging waste - domestic or otherwise - produced locally or imported, regardless of the materials used. It would be based on the following elements:

- 1) The management of packaging and packaging waste should follow a certain order of priority: i) reduction and prevention; ii) reuse; and iii) recycling of materials and recovery of energy. The design, production, and use of packaging should have a minimum of impact on the environment and, in particular, keep packaging from ending up in waste dumps.
- 2) Mandatory objectives of recovery and harmonised criteria would be proposed. Based on the polluter-pays principle, industry and trade would be responsible for wastes remaining once packaging is used.
- 3) However, the Directive will not propose harmonisation of measures for a recovery tax, which had been considered desirable due to widely varying national situations and the great variety of measures possible for achieving the same results.
- 4) The Directive should be based on Article 100A of the EEC Treaty because, in addition to its aim to protect the environment, the Directive will also contribute to completing the single market; without uniform rules, the internal market could be thrown off balance by unilateral national measures, which would lead to distortions in the free movement of goods and services. Therefore, the Directive proposes harmonising the criteria for disposal systems.

The Commission services also feel that prevention can be enhanced by programmes which avoid useless packaging and promote the reuse of packaging. This should be among the goals set at Community level and be supported by adequate incentives.

Commissioner Ripa di Meana's Communication explains why it was decided to draft a new Directive:

- a) Not taking action was no longer possible in light of the unilateral measures taken by the Member States, which could create problems within the single market.
- b) An extension of the 1985 Directive on packaging of liquids for human consumption (for which the Member State's application has been very disappointing) did not seem sufficient, since national measures have already been adopted or soon will be.

- c) The EEC feels that choosing the dual German system of recovery based on waste depositories and financial incentives for returning "lost" packaging could go against already existing systems or measures in other Member States.
- d) Developing voluntary agreements on Community level based on common objectives (as with the case of CFCs) seems very complex due to the large number of economic agents and industrial sectors concerned and the various materials used.

#### Current Situation in the Members States and in General

The Communication recalls the various measures already adopted by some Member States which are, in general, based on shared responsibility between producers, distributors, and users. In Belgium last year, the regional Flemish government signed an agreement on voluntary prevention and recycling of packaging waste with 17 user, producer, and distributor associations. The industries concerned will implement a programme in order to reduce, collect, and recycle waste and eliminate dangerous heavy metals from all packaging. In the Netherlands, the government and numerous industries agreed on a reduction of packaging waste: the 1986 level of two million tonnes per year must be reduced by 10 percent by the year 2000. The Communication says that this goal is ambitious because if nothing is done, by the year 2000 the amount of packaging waste will reach 2.8 million tonnes per year. Moreover, the 1986 material recycling rate of 25 percent must be brought to at least 60 percent in the year 2000. Finally, the disposal of packaging waste will be forbidden by the year 2000.

In Germany, a recent Ordinance of the Bundesrat requires distributors and/or producers to recover packaging for recycling or reuse. Consumers are encouraged to return disposable packaging for beverages or cleaning liquids and receive 50 pfennigs for each container returned. However, despite this system of incentives for nonreusable packaging, the percentage of reusable liquids packaging which can be returned against deposit - which is currently 72 percent - must not drop. Therefore, a dual collection system must be implemented. The Commission services are wondering whether this Ordinance does not put suppliers in other Member States at a disadvantage in relation to their German competitors.

Finally, the Communication points out that currently the estimated annual tonnage for packaging waste in the EEC is 50 million (25 for households, 15 for the services sector, and 10 for industry). Of this tonnage, 18 percent (9 million tonnes) is recycled on the average, but this percentage varies greatly from one Member State to the next. National and international regulations increasingly cover all packaging and not just those for liquids for human consumption because, as the Communication points out, the world is faced with an enormous problem of solid waste disposal. Packaging seems to be one type of waste for which action is most appropriate because it

accounts for a large proportion of municipal waste (25-35 percent of the weight of household waste comes from various types of packaging, and five percent of this is exclusively from packaging for liquids). However, the processing of packaging waste is a very complex problem due to its various forms and the great diversity of materials used. There are three categories: sales or primary packaging, grouping or secondary packaging, and transport or tertiary packaging.

#### Tropospheric Ozone Research Project Findings Reported

##### Emission Reduction Urged

91MI0450X Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German  
18 Jul 91 pp 23-24

[Text] An environmental problem that has been much discussed in recent years surfaced during this last period of hot weather: smog, which forms in the lower atmosphere as a result of greater as much as four times as high as previously in the summer daytime. Historical data also show that there was no summer smog 100 years ago.

Air chemists from more than 10 countries have joined forces to study the ozone balance in the troposphere (the lowest 10 km of the earth's atmosphere). The main purpose of the TOR [Tropospheric Ozone Research] project is the quantitative examination of summer smog in rural areas of Europe.

TOR is based at research stations in selected regions where the quantitative experimental foundation for an understanding of the ozone balance will be laid using advanced and largely newly-developed analysis equipment, part of which has been developed specifically for this project. The network of research stations stretches from Spitzbergen in the north to Tenerife in the south. The BMFT [Federal Ministry of Research and Technology] is currently financing five projects as part of TOR for a total of 7 million German marks [DM] from 1988 through 1992.

The results that have been achieved to date under this project are of primary importance for a quantitative understanding of photosmog. Comparison of this data, obtained purely by experiment, with model results show a high degree of consistency. However, there are already indications that the models are not capable of giving an adequate description of the complex problems of photosmog. Measures to reduce urban and rural ozone pollution should be based on model predictions confirmed by experimental data. The TOR project will provide the requisite data base.

Ozone is an important component of the earth's atmosphere. It protects us from high energy and life-endangering ultraviolet solar radiation. The prime responsibility for this protection is borne by the ozone layer in the stratosphere at a height of some 30 km. As the "ozone hole" phenomenon has clearly shown, this

protective layer is endangered through the use of CFC's [chlorofluorocarbons] in propellant gases and coolants.

The situation is completely different in the lower atmosphere. On the earth's surface, ozone makes its presence felt adversely owing to its toxicity. Ozone has a destructive effect on the cell components of plants, animals, and humans. Because of its low solubility in water, it enters the lungs and affects the very area where the vital oxygen exchange takes place between air and the blood. However, the ozone concentrations observable at present in the lower troposphere are still considerably below the threshold value, above which serious and lasting damage would be caused to healthy persons.

Ozone is formed under the influence of sunlight, therefore mainly in summer, in good weather, when chemical reactions (in this case photochemical oxidation with hydrocarbons and carbon monoxide) take place in the presence of nitrogen oxides.

Hydrocarbons are emitted into the atmosphere by a variety of anthropogenic and natural processes. The automobile and the petrochemical industry are significant sources. But industrial emissions, the use of solvents, and domestic heating also make considerable contributions.

However, the major emitters of nitrogen oxides, which play a key role in ozone production, remain automobile traffic, domestic heating, and large-scale furnaces (non nuclear electricity generation).

Once formed, the ozone can be carried over great distances and be detrimental to the air quality in areas far from the point of emission. An important point is that already-increased ozone values foster further ozone production. The highest ozone levels are usually recorded in rural areas where the ozone and its precursor substances have been transported by the air circulation from their place of origin, the congested urban areas. Exceptions are cities where the petrochemical industry is highly developed; peak values of several hundred micrograms of ozone per cubic meter have occasionally been registered in such areas for relatively short periods.

While the processes that lead to the production of summer smog are known qualitatively, the quantitative composition is problematic. This is because the source strengths of the primary ozone components are not known with sufficient accuracy. The necessary concentrations of primary products required for a description of the ozone balance have only become measurable in the atmosphere very recently and with very expensive experiments. There are possibly also still chemical processes in the atmosphere that have not yet been detected in laboratory experiments or which could not be correctly simulated.

In any case, strategies for the reduction of materials that cause ozone production must be applied in the congested urban areas. The emission reduction measures in industry and the introduction of catalytic convertors can

make an important contribution. Further measures are necessary to achieve a reduction in emission rates of one-third to one-fourth of their present values. A solid experimental data base, such as that acquired in the TOR project, is the fundamental requirement for extensive measures.

Further information can be obtained from: Dr. D. Kley, TOR Project Coordinator, KFA Juelich, P.O. Box 19 13, 5170 Juelich. Tel: 02461/61-3741.

### Butene-1 Concentration Decreasing

91MI0450B Bonn *TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN* in German  
18 Jul 91 p 27

[Text] Research studies of the European TOR [Tropospheric Ozone Research] project have made an interesting discovery: the concentration of the hydrocarbon compound butene-1 is falling, according to the Schauinsel measurement station in the southern Black Forest. This was reported in an interim review by Dr. Dieter Kley, director of the Institute for Chemistry of the Polluted Atmosphere at the Juelich Research Center, and TOR project coordinator.

Although a series of measurements covering two and a half years is not sufficient to confirm the observed trend, if it proves to be correct, the peak ozone pollution in Germany could decline in the future.

The Juelich Research Center has been operating the Schauinsel measurement station since 1988. Here, butene-1 hydrocarbons, along with other, mostly anthropogenically emitted (caused by humans) hydrocarbons, have been observed with an automatic gas chromatograph.

The hydrocarbon compound butene-1 is very reactive in the atmosphere and it degrades quickly there. It originates mainly from automobile traffic. Butene-1 is a very effective producer of ozone, one of the most important molecules in the generation of summer smog. Southwest Germany, and especially the Upper Rhine valley, is particularly affected every year by summer smog. Peak values of 250 milligrams of ozone per cubic meter air are not uncommon on warm summer days in cities on the Upper Rhine. Nor are the peak concentrations much less in the rural areas. Butene-1 also contributes to this peak pollution.

In past years, the observed drop in concentration indicates that the progressive equipping of automobiles with controlled three-way catalytic converters is achieving the desired effect. However, according to Dr. Kley, the ozone peak pollution will only fall if the observed emission drop of butene-1, and presumably also of other hydrocarbons, is not counteracted by an increase in traffic volume.

The European TOR research project is subsidized by the Federal Ministry for Research and Technology (BMFT).

**Baltic Sea Pollution Problems Viewed**

*91WN0643A Stockholm DAGENS NYHETER  
in Swedish 31 Jul 91 p 2*

[Editorial: "The World's Dirtiest Sea"]

[Text] Sparkling bays and screaming sea gulls, sunshine and swimming, that is the Baltic Sea on a July day.

But the Baltic is also something quite different, it is one of the most polluted seas in the world.

The ecologic balance in the Baltic Sea is seriously disturbed. We can still swim in the water on our side of the Baltic, but the species living here are not doing well.

The otters have already died out, the seals that still remain are deformed and sterile, eagles have made a small comeback but are still endangered.

As in previous years, this year the Conservation Society is conducting a campaign to spread awareness of the serious situation in the Baltic Sea. The campaign vessel Amalia anchored in Oreggrund on Monday, and Environmental Affairs Minister Birgitta Dahl acted as hostess.

We have not seen much of Birgitta Dahl in Sweden since she left office as energy minister. The environmental affairs minister has worked primarily on international agreements. We have her word for it that Sweden is a driving force, but to what extent Sweden sets a good example and implements the conventions for which we have taken the initiative is another matter.

For although the biggest environmentally hazardous discharges come from the Baltic countries and Poland, we have created our own problems. The outside edges of the sea floor, along the coast, are the sea's most productive areas. Sweden has the longest coastline, and that is precisely where our polluted streams and pulp mill waste pipes flow out. One does not have to be a scientist to see this. When too many nutrients cloud the water, light cannot penetrate and the kelp, the nursery and larder of young fish and other fauna, dies. The seaweed that remains is slowly smothered by thick green slime.

This overfertilization is largely due to a combination of traffic and many other small discharge sources. Both car exhaust fumes and nitrogen runoff from agriculture and forestry must be reduced. Birgitta Dahl views this as a much harder task because it is less controversial for a Social Democratic government to set strict maximum limits for industry than to work for a reduction in motoring and to insist that agriculture and forestry take environmental factors into consideration.

The Baltic's other major problem is toxic substances. Despite Swedish prohibitions the sea has a high PCB and DDT content and other organic chlorine compounds are still being discharged there. It is these substances that affect the higher mammals and make them sterile. The government has decided that chlorine discharge from

pulp mills must be reduced to safe levels by the year 2000. This will not be enough for the seals, for them the maximum limit is zero.

The Baltic Sea is especially sensitive to the pollutants it is exposed to. The sea is the final repository for waste from a large number of highly industrialized countries, but it is only a sound, an almost completely enclosed inland sea. The only links with the ocean are three small inlets at the southwest end.

The water in the Baltic is exchanged very slowly. Only a special combination of high and low pressure can force an adequate amount of salt water to flow in. This has not happened since 1976 when a powerful low pressure pushed the sea to the east and allowed large amounts of heavy salt water to fill the dead holes in the sea floor with life.

Birgitta Dahl pledged Monday in Oreggrund that permission to build the Oresund bridge will not be granted if it will prevent salt water from flowing into the Baltic. She said the bridge must be tested in accordance with the Environmental Protection Act before construction begins. The question is who would carry out the conclusive tests. Would they be conducted by a genuinely independent authority according to scientific principles?

Conservation Society representatives speculated that environmental pollution could also be the reason why salt water is not flowing in. Marine biologist Olle Liden mentioned climate changes as a possible cause. Such speculations are inappropriate for an otherwise serious organization. The inflow of salt water has always been irregular, but the sea has become increasingly dependent on it. The basic problem, of course, is that the Oresund channel is only 20 meters deep.

The sea was used as a campaign issue in the 1988 election. This year the economic situation is different and questions of long-term survival must take a back seat to short-term pocketbook issues. At the same time there is also some hope for the Baltic Sea. The hope lies in a positive trend for our neighbors on the other side of the water. For only steady economic development will make it possible to concentrate on the environment.

A continuous debate on the environment is needed. Obviously it is a problem that many of the reservations expressed by the different parties merely concern discharge levels within the margin of error. But it is even worse that the government has chosen to present an environmental bill that is so big and comprehensive that not even the committee can go through it. Neither the good nor the bad aspects of the bill have received the attention they deserve.

## FRANCE

**Renault, Atochem Join Car Recycling Effort**

91WN0489X Paris AFP SCIENCES in French  
7 May 91 pp 39-40

[Text] Marquette-Lez-Lille—Some automakers and salvagers predict that a "green," 100-percent recyclable automobile will be the rule in 10 to 15 years. In the meantime, salvagers of wrecks must find a way to reduce the 30 percent of "sterile," polluting, or nonrecoverable waste that comes out of crushers.

So Cibie Co., a Marquette-lez-Lille (a suburb of Lille) salvage company, has taken up the challenge. In collaboration with Renault and Atochem (chemicals), it has been seeking ways to shrink the mountain of waste for a year. Four hundred thousand metric tons of various materials are produced each year in France from two million crushed wrecks. "There are fewer and fewer waste grounds and prices have increased tenfold in three years, while the volume of waste is steadily growing," sums up Mr. Jean-Paul Delbert, the young president and general manager of Cibie.

The cars that are sent to the wrecking yard today average eight years in age, and were built at a time when ecology was still low on the list of manufacturer concerns. Magnetic rollers in the crushers make it possible to sort out 68 percent of the ferrous material, which is directly reusable in steelmaking. Two to three percent of the waste is nonferrous metals. The remainder (plastics, rubber, foams, and textiles) must be burned.

Cibie's employees began by meticulously stripping down 50 chassis, by hand. "The first problem was identifying the 50 or so different kinds of plastics, which make up half of the "sterile" material," says Mr. Delbert.

The solution is now in hand, and Renault began to use it on its Clios. No more than four or five kinds of recyclable plastic are now used. Parts—bumpers, tanks, decorative strips, etc.—are marked to make them easier to disassemble and sort, operations which must be completed before the chassis is fed into the crusher.

That leaves the textiles, foams (which release chlorine gas during burning) and tires. The tires can be reduced to dust. The rubber that is extracted during the process is used to make bicycle tires or protective covering for vinestocks. The uses are minimal, however, compared to the volume of waste generated.

While Atochem and Renault ponder possible recyclable substitute materials, Cibie is investing 5 million French francs [Fr] in a pilot factory for disassembling chassis. The plant is scheduled to begin operation next fall.

The wrecks will be attached to a carousel that will have 10 stations to start with. The fluids (fuels, oils, brake fluid) and all nonmetallic substances will be recovered at those stations. "Let's not talk about robotics yet," stressed the project's head, Mr. Guy Housset. "It will be a

mechanized line that will use tools borrowed from various professions and adapted for our purposes."

Industrial disassembly will be the next step, with green cars designed from the moment of their construction to be destroyed. As an example, Mercedes announced last March that it had succeeded in building some cars from totally recyclable materials.

**Environment Minister Urges Measures Against Greenhouse Effect**

91WN0619A Paris LE MONDE in French  
21-22 Jul 91 p 8

[Article by Yvonne Rebeyrol: "France Mobilizes Against the Greenhouse Effect"]

[Text] In a report to the Council of Ministers dated 18 July, Mr. Brice Lalonde, minister of the environment, described the greenhouse effect which threatens the earth with global warming and he put forward the measures to be taken "over one or two generations." France wants to bring pressure on international negotiations for a common European action.

Indeed, the consequences of the greenhouse effect—rise in the sea level by several decimeters, and increase between 1.5°C and 3°C in the average temperature of the planet—will not take place until several decades from now. However, the inertia of the atmosphere and, even more so, that of the ocean (the boiler of the heating system in the ocean-atmosphere partnership), and the life span over several decades of the gases which produce the greenhouse effect (carbon dioxide, methane, nitric oxides, chlorofluorocarbons [CFC's], and others ...) are such that it is imperative to start doing something about it right now, on a national, European, and worldwide scale, if we really want to keep the concentrations of the gases at their current levels and thus to limit the long-term effects of global warming on the climate of the planet.

Mr. Lalonde emphasized on Friday, 19 July, during a press conference, that the other ministers did not look into the measures to be immediately taken with enthusiasm: Indeed, some measures will inevitably be unpopular. They run the risk of limiting, in the developed countries, the use of the "tools" which are, either wrongly or rightly, commonly considered to be indispensable.

The remarks of Mr. Lalonde are confirmed by the reports prepared at the end of last year by the Academy of Sciences as well as by an interministerial group whose report was written by Mr. Yves Martin. The minister explained that this plan will be compulsorily extended over at least two decades, "perhaps over one or two generations."

The emissions of carbon dioxide, methane, and the other gases which produce the greenhouse effect continue to increase. The concentration of these various gases in the

atmosphere is therefore on the rise: currently 0.5 percent a year for carbon dioxide (i.e. + 26 percent since 1850), 0.9 percent a year for methane (i.e. + 115 percent since 1850), 0.25 percent a year for nitrous oxide (i.e. + 8 percent since 1850), 4 percent a year for CFC's 11 and 12 (in use since 1930), etc.

The climatic variations in the past (at least during the last 150,000 years) follow very closely the variations in concentrations in the atmosphere of carbon dioxide and methane: The less carbon dioxide and methane there is, the colder the weather, and vice versa.

The responsibility for the current increases in the concentrations of greenhouse gases is very unevenly distributed: One quarter of the world's population (that of the developed countries) is the source for three-quarters of world emissions of greenhouse gases. In the industrialized countries, the consumption of fossil fuels, the main source of carbon dioxide, is also very uneven (the United States emits each year, through consumption of these fossil fuels, five tons of carbon, the former East bloc countries—3.8 tons of carbon, France—1.9 tons of carbon). Moreover, the operation of the economy in every industrialized country must not be adversely affected by national measures. Indeed, development implies an increase in energy use and no one can be opposed to progress in the developing countries.

#### Difficult Consensus

No one disputes either these figures or these imperatives. But it will probably be very difficult to arrive at a national consensus and, even more so, at an international consensus on the measures to be taken to reduce these gas emissions which threaten the very future of humanity. The interministerial group on the greenhouse effect has taken stock of the various actions which could be taken on a national scale by classifying these measures according to the cost which each ton of carbon which we could avoid spewing into the atmosphere would amount to: zero francs [Fr], a few savings in fossil energy; less than Fr50, substituting classic CFC's with new products, and especially recovering the CFC's present in appliances (refrigerators, in particular) no longer in use; more than Fr60, replacing the waste-dumping of putrescible products (source of methane) by incineration or composting; more than Fr200, filtering of smoke; more than Fr350, reforestation (which immobilizes substantial quantities of carbon); more than Fr500, filtering of smoke from certain electric power stations; more than Fr600, catalytic converters on automobiles; more than Fr1000, replacing electric power stations which burn fossil fuels with nuclear power stations and developing the use of renewable energy sources.

On a European scale—not to mention a worldwide scale—such measures imply coordination of taxes on fossil fuels, therefore specifically on highway transport, urban traffic, etc., and the price paid for the fuel.

Two main factors affect prices: The cost of labor and the cost of energy. One can hardly accept the idea of

increasing the cost of labor, which would inevitably cause unemployment to rise. One can therefore only do something with the cost of energy, but coordinated, first on a European scale, and then on the scale of the 159 member states of the United Nations.

Above and beyond all these measures, it is also absolutely necessary to intensify research on the oceans and the atmosphere (to which the brand new European satellite ERS-1 will make a substantial contribution), and to broaden interdisciplinary studies, in particular on the functioning of cities, on heat insulation, on motors, etc.

#### Environment Minister Views Future Policy Options

91AN0498X Paris SCIENCES & AVENIR (Special Issue No 83) in French Jul-Aug 91 pp 4-5

[Interview with French Environment Minister Brice Lalonde, by Marie-Jeanne Husset: "Science's Hopes"]

[Text] For the environment minister, some of the major missions of research are: Estimating the number of living species, understanding the function of the carbon cycle, and studying soil contamination levels and the impact of new technologies.

[Correspondent] Protection of the environment is currently one of the major concerns of the French. This concern is recent. How is your ministry coping with this new demand of society?

[Lalonde] When I became Minister of the Environment, I very quickly realized that the structures that were set up 20 years ago were obviously not up to today's problems and that there was the risk of a growing gap between the ever more urgent expectations of society and the too limited responses that we were able to provide. I therefore asked the government for a substantial increase in my ministry's budget, especially for work in the field, e.g., for the establishment of genuine regional services and the creation of an environment and energy control agency.

Having said this, there would not be a viable Environment Ministry if there had not first been companies, associations, elected politicians, officials from all departments, journalists, or consumers who voice their opinions, become active, and take responsibilities in their fields. My ministry acts as a mediator among these parties, encouraging their initiatives, stimulating discussions, and interpreting the public's more or less vague concerns and demands to the other ministries and the government. The politically important thing is that the department in charge of the environment must better correspond to what each of us expects of it. It must provide solutions to concrete problems of everyday life.

This is not always the case because it often happens that we are not involved in crucial decisionmaking processes,

such as selection of major infrastructure programs, high-speed trains, highways, electric power lines, dams, etc. In this respect, I proposed and obtained major changes, since the environment will now be represented in the agencies that really count in the decisions, such as the Interministerial Commission for the Development of the Territory or the Economic and Social Development Fund (FDES), which plays a major role in the targeting of public investments.

We must thus become better organized to meet the demands, but also to foresee them whenever necessary and be able to anticipate future problems and alert public opinion, even at the risk of preaching in the desert for a long time and being accused of being prophets of doom. This watchdog role is also another fundamental function of any environment minister: The ecology has paid too long for being almost always "one battle behind."

[Correspondent] Protecting nature, fighting pollution, improving the quality of life, protecting the planet: How can you fight on all fronts, from local to global issues, and reconcile sometimes contradictory demands?

[Lalonde] The only way to fight on all these fronts is by better distribution of responsibilities and establishment of a schedule with priorities and goals with a well-defined time frame. This was done in the national environment plan which I submitted to Parliament for discussion in October 1990 and which last December was accepted by the government as a general guideline for the next 10 years. As far as I am concerned, from this plan, which is in line with European policy, I singled out three priorities for 1991: water, waste, and protection of coastlines. This is not incompatible with the efforts that we have undertaken since 1988 to give France some power of initiative in international negotiations, in particular on global problems: In Madrid we just signed the convention on the Antarctic and we are actively preparing for the 1992 world environment conference in Rio de Janeiro, which will bring together the countries of the Northern and Southern hemispheres. Of course, it is not very easy to prioritize constantly these regional, national, or international levels: My position, which corresponds to a certain permanent feature of French policy, is that we must try to instill as much scientific objectivity and social justice as possible into these decisions.

[Correspondent] What role do you assign to research in this policy?

[Lalonde] An essential role. Indeed, environment policy shares with health policy the fact that it cannot be elaborated without continuous input of scientific data and know-how. In this field, research is not only one useful instrument among several others; it really plays an essential role. We are indebted to scientists for having alerted us to the major problems that threaten our planet as well as our everyday life. We are turning—and will have to turn more and more—to them for preparing

standards or implementing technical innovations without which there can be no durable improvement of the environment. This is a major task and responsibility which affects all research sectors: fundamental science, applied research, or technological innovation.

In this area, like in many others, we have fallen somewhat behind in the past; environmental research suffered badly from the consequences of the budget restrictions imposed as a result of the economic crisis, which caused a 40-percent reduction in the budget of my ministry between 1986 and 1988. Industrial companies have only recently become aware of the economic stakes involved in the development of clean technologies or products. Until the early eighties, scientists working on environmental issues in the major laboratories had difficulties—that is a euphemism—in having the scientific significance of their research work recognized and obtaining adequate funding.

True, the trend has definitely been reversed these last few years, but one cannot reasonably be satisfied with a situation in which 60 percent of world research is conducted by two countries: the United States and the former Federal Republic of Germany. The national environment plan thus recommends a quadruplication of government and private expenditures for environmental research within 10 years. We must also improve coordination, acquire a better understanding of the research potential in each organization, establish cooperative structures in major industrial sites, and provide concrete solutions to the problems of hiring young researchers and of training procedures.

[Correspondent] Should the Environment Ministry be directly involved in this research?

[Lalonde] I noticed that all the environment ministries which conduct an active policy—the United States, Sweden, the Netherlands, the former FRG, etc.—have their own major research institutes, budgets, or departments. This is no accident. In order to conduct an appropriate environmental policy, efficient research is needed and, for research to be efficient, it must be solidly linked to society's demands and to political action. My ministry now obtains about three to five percent of the government's research budget for environmental research in France. Considering what I have already said about the significance of this research, it would be alarming to fall short. I have explained the general reason on the basis of foreign examples. I will add one which is more specific to France: If we wish to use our research potential more efficiently in the future, we must absolutely fight against this very old inclination to separate administrative expertise, reserved to the administration, from scientific knowledge, too often confined to the world of science.

[Correspondent] In your opinion, what are the major problems that the environment poses to scientists?

[Lalonde] Many major questions remain unanswered. For instance, such an elementary issue as the approximate number of living species remains unknown: Estimates run from five to 30 million species, and the available estimates as to the rate of their disappearance vary from one to 10. Similarly, we have only a very limited understanding of the function of the carbon cycle, which plays a decisive role in the greenhouse effect. We cannot even determine, to within 30 years, when the obvious increase in carbon gas in the atmosphere will have visible effects on global warming. Scientists have given themselves 10 years to provide more precise answers on the climate.

Naturally, like many environment ministers, I would like to see this time frame shortened. I am also concerned by issues that are less talked about, such as the deterioration of the soil or the impact of new technologies on the environment. I am thinking particularly of biotechnology and new materials. Finally, I keep in mind that there are still many uncertainties as to the real causes of the death of forests or the long-term evolution of the ozone layer.

I would, however, insist on the fact that the environment also poses problems to scientists other than what you call "major questions." The consequences of the abandoning of agriculture in some mountain regions, the evolution of swamps in the west, the ecological situation of the major rivers, the toxicity of some chemical products used every day, these and many other subjects are ones that we would also like researchers to tackle. In addition to the indispensable major programs, we thus have to invest to a far greater extent than at present, in key disciplines such as ecology, toxicology, or economic and social sciences and substantially develop our capacities for permanent observation (as will be done with the creation of the future French Environment Institute).

[Correspondent] The scientists' time frames are not the same as the politicians'. Global warming, the hole in the ozone layer, waste disposal and storage, water pollution.... Politicians often demand answers from scientists that the latter are unable to give. How do you handle the uncertainty without taking the scientists hostage? What then is the role of the experts?

[Lalonde] The experts have an irreplaceable role to play: Translate scientific knowledge into information that can be used by the politicians in charge. Since they have this formidable power, their independence must be protected but it must be avoided that anybody obtains a monopoly on expertise. The pluralism of experts is an essential guarantee for the proper functioning of a democracy and I would like to see this gradually become the rule, although I am aware that this is a principle that is not always easy to implement in France. However, I have tried to apply it to the Loire improvement projects and radioactivity measurements.

Having been an expert myself, I am aware of the distance between the function of an expert and that of a politician. There always comes a moment when a decision has to be made in the face of uncertainties. Today, in view of the major hazards threatening the planet, there can be only one rule for action: Be cautious, i.e., act without having absolute certainties so as not to mortgage the future. But I am beginning to take into account political rhythms and I am trying to give citizens the means for applying pressure on the political system, regardless of who the representatives of that system may be.

## GERMANY

### New Technique Reduces Heating Plant Sulfur Fallout

91WN0274A Dusseldorf *WIRTSCHAFTSWOCHE*  
in German 8 Feb 91 pp 80-81

[Article by Wolfgang Kempkens: "Just Gray Powder"]

[Text] Grosse Müggelsee in the east of Berlin is a beloved excursion goal. The S-Bahn stops not quite 1000 meters from the water in the city district of Friedrichshagen, which nestles along the northern bank. Sometimes, above all in the winter, there is a bad smell in the air which emanates from the local heating plant. Brown coal is burned there, whose sulfur is able to reach the surrounding area unhindered.

There are seven boilers, each with a thermal capacity of 5 megawatts, which blow a total of approximately 1,000 tons of sulfur dioxide into the air. One of them has now been contained. An investment of a few hundred thousand marks was sufficient to increase its capacity by about 20 percent and simultaneously reduce the sulfur output to one-third. This boiler, which, just as the others, feeds heat into the Berlin district heating grid, is thus the first in eastern Germany to meet the norms established by the western Technical Air Direction. Two thousand milligrams of sulfur dioxide per cubic meter are permitted for small boilers. The retrofitted boiler emits less than 1,000.

This feat was accomplished by the Geko mbH engineering company in Essen, which has specialized in environmentally harmless burning of fuels and harmful substances. The brown coal used at Friedrichshagen, which contains up to 50 percent water, is delivered by rail in large clumps. Before a mill breaks up the brown coal into pieces that fit the boilers, it is sprinkled with a gray powder. This consists essentially of lime (calcium carbonate) which is mixed with a number of process-accelerating additives. During the intimate contact between powder and fuel an ion exchange takes place. The multiple chemical compounds of sulfur, chlorine and fluorine break up, as does the calcium carbonate. The fragments seek new partners. Finally, the noxious substances are firmly combined with the calcium. In the combustion the newly formed calcium compounds

remain unchanged, as long as they are not heated to more than 850 degrees Celsius. Ultimately, they are recovered as ash.

When the expensive measurement and control technology and the powder addition step had been installed at Friedrichshagen, the Geko engineers dared give it a test run. They themselves were surprised. The sulfur emission was simply cut in half. "If all the 8,000 boilers of the thermal power and thermal heating plants in the east were improved with these two measures alone, the present sulfur emission of 800,000 tons annually would be reduced to half," says Otto Faatz, development engineer at Geko, enthusiastically. The environment would be spared 130,000 tons of sulfur dioxide if all the boilers were equipped with new grates, as was done after the first test run at Friedrichshagen.

Operators of the eastern Berlin heating plant, whose dioxin emission, quite incidentally, also dropped below the new upper limit of 0.1 nanograms per cubic meter, is today the Berliner Kraft- und Licht(Bewag)-AG, a subsidiary of the power giant in Hanover, Preussen-Elektra AG. Bewag is to assume the costs for Falkenhagen—about half a million marks—as soon as the measurement results have been acknowledged. But Geko has a hard time receiving additional retrofitting orders. The western power suppliers, who have their say in the east as well, prefer to invest in demolition and reconstruction than in retrofitting.

The Geko technique has been tried out over a few years in a pilot plant at Waimes in Belgium, between Eupen and Malmedy. Faatz and his team have tested the most dangerous combustible materials there. The wonder powder, as confirmed by the TUeV [Technical Monitoring Agency] in Essen, after extensive measurements handles household and special waste as well as wood waste from furniture production and brown coal. In the Belgian pilot plant the combustible material is burned on a grate developed by Geko. It consists of several levels, over which the embers are successively pressed. Air is sucked through from a ventilator, which is located at the end of the facility, in the chimney. The hot combustion gases give off their energy in a recuperator to a water/steam or air cycle. It can be utilized as process steam in industry, to power a turbo generator or directly as district heat. The waste gases, still at 170-degrees Celsius, are cooled in a reactor until they condense. The water droplets that form wash out the remainder of the harmful substances, which are retained in a filter.

The plant was originally conceived for burning garbage. Geko managing director Francois Ostwald really gets going on this subject. In an honest, comprehensive, assessment of the subject of energy consumption and environmental tolerance, he is certain that decentralized combustion in relatively small plants will come out far more favorably than all recycling concepts. The Geko technique would clearly fall below even the new, drastically lowered limit values for all harmful substances (WIRTSCHAFTSWOCHE 2 Jan 1990). Some interested

parties are already hooked on his bait. Three garbage burning facilities are to be built in eastern Germany, two in the area of Munich and one in Italy.

Ostwald wants to contain even large power plants, such as are operated in eastern Germany with a total output of 15,000 megawatts, with his gray powder. But he doesn't want to rush into anything. "To start with," he announces, "we are limiting ourselves to small plants, for which we are sure that our technique works."

### Rape Seed Oil Considered Cleaner Heating Oil Alternative

91WN0320B Frankfurt/Main *FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT*  
in German 19 Mar 91 p 8

[Article by vwd: "Rocket Burners Using Vegetable Oils"]

[Text] Hamburg, 18 March (vwd)—Rape seed oil could in the future also be used as an energy source. This is the result of a series of experiments conducted by MAN [Maschinenfabrik Augsburg-Nuernberg] Burner Construction, Hamburg, which, according to in-house estimates, developed a promising concept for the future as regards the use of renewable energies in private home heating systems. Rape seed oil is said to be outstandingly suitable as a renewable source, according to the burner construction division of MAN B+W Diesel AG [Inc.] on the occasion of the International Sanitary and Heating Fair in Frankfurt. Technically, it was noted, there is no longer any problem when it comes to burning rape seed oil. There is as yet no concept for producing and making available corresponding quantities at competitive prices.

According to data supplied by the enterprise, one liter of rape seed oil in 1990 cost an average of 78 pfennigs, while one liter of heating oil cost 49 pfennigs. Germany produced 480,000 tonnes or rape seed oil but only consumed 36.3 million tonnes of light heating oil. The "rocket burner" that was used for the series of experiments, according to data supplied by MAN Burner Construction, could, without any major design changes, also be operated with other vegetable oils, such as sunflower or palm oil. A mixture of two parts of heating oil plus one part of rape seed oil was used during the series of experiments and that already made it possible considerably to reduce the emissions.

MAN Burner Construction emphasizes that the economic feasibility calculation however would also have to include the costs for environmental and health damage. For example, rape seed, like any other plant, could contribute to the reduction of carbon dioxide because combustion would release only as much carbon dioxide as the plant would take out of the atmosphere during its growth. Besides, the sulfur dioxide and the nitrogen oxide emissions would be reduced considerably because rape seed oil contains only traces of sulfur and no nitrogen. Furthermore, the farm surpluses would be reduced. The albumen-rich residues, that are generated during the pressing of the rape seeds, could be used as

animal fodder and the remaining rape seed straw could be processed into packaging material.

### **Energy-Saving Hydrogen Extraction Process Developed**

*91MI0397X Bonn WISSENSCHAFT WIRTSCHAFT POLITIK in German 12 Jun 91 p 4*

[Text] Hydrogen is an environment-friendly energy source that can be used in a variety of ways. However, the future use of hydrogen as a secondary energy source depends decisively on the efficient extraction of hydrogen by water electrolysis using nonfossil primary energy, for example solar energy. In this latter case, it is particularly important that the efficiency of existing water electrolyzers be increased from about 75 to over 90 percent. The Juelich Research Center has developed an energy-saving, economic electrolysis process for this purpose.

The conventional industrial technique of electrolytic water decomposition into hydrogen and oxygen encounters two problems in particular: insufficient catalytic activity and long-term stability in the electrodes, coupled with the separator's temperature sensitivity, which makes it impossible to improve efficiency by raising the temperature. The Juelich Center's advanced energy-saving technology overcomes these disadvantages. Its water electrolysis process can also be used to produce solar hydrogen. Since 1989, a 10-kw electrolyzer, built at the Juelich Research Center for the German-Arab HYSOLAR [Hydrogen from Solar Energy] project, has been running successfully on photovoltaic solar current in intermittent operation at the DLR [German Aerospace Research Institute] in Stuttgart.

### **Juelich Center Developing Environmental Compatibility Test for Research Projects**

*91MI0422X Bonn TECHNOLOGIE NACHRICHTEN-MANAGEMENT INFORMATIONEN in German 13 Jun 91 p 11*

[Text] The question of environmental compatibility is of prime importance not only in the actual planning and building of technical plants; greater efforts are also being made to give adequate consideration to environmental aspects right from the decision-making stage of future policy, plans, and programs. From this stems the need for the state research funding system to examine how far the potential effects of planned lines of development on man and the environment can be identified and taken into consideration at an early stage when deciding on funding for technological projects.

Since the beginning of 1990, the "System Research and Technological Development" program team at the Juelich Research Center has been working on a project commissioned by the BMFT [Federal Ministry of Research and Technology] to develop a method for "environmental check-ups for research projects." The aim is to develop and field-test a practicable procedure

for establishing, initially, the necessity and, subsequently, the content and thoroughness, of an environmental compatibility study on research projects. The attempt will be made to bring the principle of prevention of environmental pollution, which is enforced when new technical plants are built via the environmental compatibility test prescribed by law, to bear on research projects as well.

A catalog of questions will be drawn up for future use in the systematic assessment of new research projects and programs with regard to environmental aspects:

- Which repercussions on man and the environment are significant in the research project?
- What effects are known and which can be assessed? Where are there gaps in knowledge (i.e., the need for research) of repercussions on the environment?
- Which effects require further detailed examination?

Criteria for environmental compatibility include factors such as the persistence of substances used in a research project, their tendency to spread, their accumulation, and the degradation processes involved.

The knowledge of any risks to the environment and the application of this knowledge from the research phase onwards promises economic as well as ecological advantages.

Accordingly, industry is also making an effort to integrate environmental aspects into research and development studies.

In addition to the methods proposed by the System Research and Technological Development program team, the roundtable on "Preventive Examining for Environmental Compatibility in Research" held at the Bonn Science Center on 5 June 1991 therefore also presented and discussed further approaches and their potential application, both in projects that are already close to market and in others that are still a long way off.

The project, which has a 300,000-German mark BMFT grant, is scheduled for completion at the end of 1991.

Further information can be obtained from Mr. W. Huber, Juelich Research Center, System Research and Technological Development Program Team, P.O. Box 19 13, D-0-5170 Juelich. Tel: 02461/613584.

### **Process for Recycling Sludge Containing Heavy Metals Developed**

*91MI0404A Bonn DIE WELT in German 18 Jun 91 p 19*

[Article by Lutz Bloos: "Raw Materials Instead of Garbage"]

[Text] Sludge containing heavy metals became a serious environmental problem some time ago. The method used to deal with it so far is anything but satisfactory, but a new process is now about to remedy the situation.

Until now, soil and sludge containing heavy metals were reconditioned primarily in what is termed a hydromechanical wash. This way, the pollutants are precipitated onto fine grains measuring less than 200 microns, and this heavy metal concentrate is then offloaded on waste dumps. Although this considerably reduces the dump volumes, the concentrations are proportionally higher than in the original material. The dumps could thus become time bombs for future generations.

In order to mitigate this problem, the Federal Ministry of Research and Technology has funded the development of a process for recovering heavy metals from sludge. The Hamburg-based firm ROM has set up an experimental system based on the process developed in Heidelberg by Professor German Mueller for extracting heavy metals from sludge. The plant can process 400 kg of sludge per hour with 20 percent dry matter and will demonstrate the technical feasibility of the process on a larger scale.

Sludge polluted by heavy metals is first treated with hydrochloric acid, hydrogen peroxide, and diatomaceous earth and thus dissolved. This releases large quantities of carbon dioxide, which is reused in the penultimate state of the process, carbonate precipitation.

In a subsequent washing and filtering bed, the suspension is largely drained, with the result that what leaves the plant is sludge with 60 percent dry matter, free of heavy metals. The sludge is then dried further, after which it can be used as a normal earthwork material.

The filtrate, which now contains the dissolved heavy metals, is subjected to hydroxide precipitation with caustic soda. Filter presses are used to concentrate the hydroxides to 25 percent dry matter. The sludge is fed into a collector and, together with the sludge from the subsequent carbonate precipitation, either dumped or processed into raw materials in metal works, processing being preferred.

Both milk of lime and carbon dioxide are used for carbonate precipitation. The efflux from this last stage of the system contains only a residual 2.5 to 5 percent of the original heavy metal content and is, as project leader Jens Niemann guarantees, "well below drinking water tolerance values," even though mercury cannot be extracted.

A soil wash is used prior to decontamination when reconditioning contaminated soil. In the future, both stationary plants using the Mueller process and mobile versions on board ships or, for fairly small quantities, on trucks, will be used.

### Adoption of Swedish Model for Refuse Incineration Urged

91MI0449X Bonn *TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN* in German  
18 Jul 91 pp 9-10

[Text] The compulsory recycling of waste paper proposed in the Regulation on Waste Paper would cause the current surplus of waste paper to grow even larger, according to President of the Federal Association of Printing Hans-Otto Reppekus in his 1990 Annual Report. Despite increasing recycling, it is not possible for the papermaking industry to reuse all waste paper.

Reppekus pleaded for paper and packaging waste to be incinerated on the Swedish model, instead of just dumping it onto the growing mountains of refuse. Not only is the development of special power stations for waste paper being considered there, more than half the annual volume of household refuse (of just under three million tonnes) is being burned in 23 district heating stations. In contrast, 70 percent of the household refuse in the old German laender still finds its way to the dump.

In contrast to the Federal Republic, the Swedes, who have practically no natural gas, do not just use refuse incineration to reduce their dependence on oil and coal. Since, according to information from the paper-making company STORA, two tons of packaging material correspond in heat value to one ton of oil, and since 40 percent of household refuse by weight consists of paper waste, the Swedes currently heat 250,000 flats with thermal energy from household refuse. The largest of the 23 refuse-fired works, with an incineration capacity of 200,000 ton of household refuse per year, are in Uppsala, Gothenburg, Malmo, Linkoping, and Stockholm. Gothenburg already supplies 60,000 flats with hot water and 30,000 with electrical energy by burning refuse; it wants to double its combustion capacity by 1994 and increase it to 400,000 tonnes per year.

The city of Uppsala has been covering the heat requirements of 95 percent of its households by burning household waste since 1985. Because Uppsala (which has only 160,000 inhabitants) does not produce enough refuse, other local authorities within a radius of 95 kilometers deliver theirs to the energy-supply utility Uppsala Energi AB. The price paid by Uppsala Energi for a tonne of household waste depends on the amount of sorting required. Last year it was the equivalent of 13 German marks [DM], it is currently only about DM4 per tonne. As of 1992, the local authorities will be supplying their waste even for no fee because they will save dumping costs. The households connected to the district heating network (some 110,000 units) benefit from the disposal costs saved.

Thus the Swedish population accepted this type of refuse processing, although after initial resistance. According to Managing Director of Uppsala Energi Lars Astrand, even the Swedish Greens may now have come around to acceptance. The Swedish wood-processing industry,

hence the cellulose, paper, and packaging manufacturers, is in favor of burning household waste because the high proportion of paper and packaging waste that it contains provides a valuable biofuel, just like all waste paper that cannot be reused. Finally, a paper fiber may only be reused three or four times, even with corresponding deterioration in product quality, stresses Dr. Alexander Donetzhuber of STORA Technik AB. Seen this way, it is impossible to avoid the question of what is to be done with paper and packaging waste, even despite ingenious recycling techniques. Burning may be better than dumping in any case.

The VDI [German Association of Engineers] meeting on questions of waste combustion in Essen on June 19, concluded that: waste incineration plants reduce waste up to about one-tenth of the volume, preclude the hazard of large-area pollutant distribution presented by other techniques, and utilize energy released for power generation or district heating. In this way, some 200 kg of mineralized, reusable ash which could be used as building material is obtained per tonne of waste. For example, the waste-burning plant in Uppsala annually sells considerable quantities of slag as building materials. The Essen VDI meeting also confirmed that the heavy metals, salts, and pollutant-loaded flue dusts can currently be processed to such an extent as to leave a residual quantity of only 3 kg of material to be disposed of from one tonne of household waste.

The emission guidelines in Sweden for new refuse-incineration plants are just as strict as in Germany (including a dioxine limit of 0.1 nanogramm/m<sup>3</sup>). "This means that refuse incineration is nowadays a dioxine destroyer and no longer a dioxine producer," says Uppsala Energi boss Astand. Technology Director Mats Karlsson of GRAAB [Gothenburg Waste Processing Company] adds, "A hundred times as much dioxine arises in dumping refuse as in burning it."

#### Research Ministry Launches Water Conservation Program

91M10448X Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German  
18 Jul 91 pp 5-6

[Text] If water conservation is to be improved, ecological strategies designed to restore the natural functioning of our rivers and lakes must be more widely applied. An improved scientific basis must be developed for these strategies which are needed to translate the Federal Nature Conservation Act into action. The priorities are:

- Further development of existing quality assessment techniques for waters (flowing waters, standing waters, and groundwater), taking account of further physical, chemical, biological, and economic regional aspects;
- Assessment of the ecological effects of the exploitation of waters (agriculture, forestry, fisheries, trade and industry, housing, traffic, leisure, recreation, water supplies;

- Measures to reduce water pollution, the drawing up of reclamation strategies, creative concepts, and close-to-nature development measures based on systems-oriented research.

The accession of the new federal laender has brought the Federal Republic of Germany new problems and tasks of water research and reclamation. Massive extraction of lignite has created enormous cavities (left behind after open-cast mining) that are gradually filling with ground water. Preventive water quality control principles must be drawn up for the resulting lakes, some of which are large and deep. There are many unknown factors regarding the nature and structure of the ground in open-cast mining holes, the nutrient content, and the plankton growth, which affect the oxygen content.

Solving the problems posed by the standing waters in the new federal laender, many of which, including reservoirs, are eutrophic, requires new knowledge such as how the different types of ecosystems in lakes and reservoirs actually function. Although lake research goes back decades, it has not yet succeeded in arriving at generalizations and ecologically based management strategies merely by analyzing prevailing conditions. New environmental processes and strategies must be developed if progress is to be made in the reclamation of standing waters.

The concrete topics for standing-water research are:

- Effects of water-level fluctuations on the quality of reservoir water;
- Long-term stability of the balance of substances and the biological processes in standing-water ecosystems;
- Analysis and ecological assessment of substance and energy transfer via microorganisms in lake ecosystems.

Rivers and lakes play a decisive role in the overall ecosystem and in the global hydrologic cycle. Their ability to function naturally is endangered by the many different uses to which they are put by man. Integrated approaches are required to reclaim the polluted lakes and rivers and to enhance their natural functions again.

The BMFT [Federal Ministry of Research and Technology] is seeking to make a contribution in the form of its "water ecology" funding strategy. It covers three overall topics:

- Ecology of minor rivers, reclamation strategies for minor rivers;
- Ecology of standing waters, with a subproject on reclamation strategies;
- Ground water pollution.

The minor rivers topic has top priority within the funding strategy.

In addition to project funding, institutional funding for water research is also being stepped up. New research facilities are being founded in Magdeburg and Berlin (East). The first session of the founding committee for

the planned Institute of Aquatic Ecology and Inland Fishing in Berlin (which is to have about 100 employees) took place on 28 June, 1991. The process of founding the two institutes is scheduled for completion this year.

The BMFT is providing DM30 million in water ecology research project funding over the period 1991-1995. Institutional funding over the same period is running at about DM100 million.

### Federal Ministry Funds Geothermal Plants in New Laender

91M10447X Bonn *TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN* in German  
18 Jul 91 pp 4-5

[Text] Three geothermal plants with a total output of 22 MW<sub>(th)</sub> (thermal output) are currently running in the new federal laender. These are plants designed to exploit hydrothermal occurrences in Neubrandenburg, Waren, and Prenzlau, each of which is in a different technical stage. They are mainly being used to heat buildings and supply hot water.

Because of their interesting energy potential, the BMFT [Federal Ministry of Research and Technology] began to fund a series of research and development projects immediately after the unification of Germany. The aim was to obtain and extend the geothermal know-how of the new federal laender. Short-term grants of around 3 million German marks [DM] were allocated for this purpose.

These are the projects in detail:

- Regional studies of geothermal reserves and resources in northwest Germany. Cooperation between the NLFB [Lower Saxony Regional Office for Soil Research] and Geothermie Neubrandenburg GmbH. BMFT funding of DM1.165 million corresponds to 70 percent.
- Comparative location study with calculation of economic viability. Cooperation between Geothermie Neubrandenburg GmbH and Energieconsulting of Heidelberg GmbH and the Rheinland-Westphalia Electricity Work [RWE]. BMFT funding of DM196,000 equals 100 percent.
- Geothermal charting work: Environmental and Economic Geology Corporation, Berlin. BMFT funding of DM932,000 equals 100 percent.
- Energy supply system taking account of the geothermal resources in the town of Neustadt-Glewe. Heating Systems Installation Company, Berlin. BMFT funding of DM170,000 corresponds to 90 percent.
- Geological and process engineering studies with a view to utilizing geothermal energy: Geothermie Neubrandenburg GmbH. BMFT funding of DM960,000 corresponds to 80 percent.

The aim of the projects funded is to work out as quickly as possible investment decisions for modernizing old

plants as well as bases for building new ones. The prime contractor to erect and operate the plants, necessary before the work can continue, has yet to be named.

Based on the findings of a technical conference on geothermal science that took place in Berlin in April of this year, operation that is close to economical can be expected if geothermal plants are integrated into the basic load of local authority supply systems with more than 5,000 full-load hours per year. Concrete decisions by the local authority utilities concerned in the new federal laender, some of which are in the establishment phase, are needed.

BMFT decisions to fund pilot plants are expected to be based on the results of a comparison of locations and economic projections, which are to be presented this year. A particular problem in this regard is that of the salinity (salt content) of the warm ground water.

Apart from hydrothermal utilization, the opening up of geothermal energy at great depth must also be assessed. A priority of BMFT funding in the past few years has been the HDR [Hot Dry Rock] technique: cold water is injected into the hot substratum through injection drilling, where it circulates, heats up, and is fed to a power station via a second drilling in the earth's surface. At the beginning of 1990, it was possible to integrate European efforts under the guidance of Siemens and with the participation of additional German companies into a European consortium. Along with the EC Commission, France (BRGM [Geological and Mining Research Office]), and Great Britain (RTZ Consultants Ltd) also belong to the consortium.

The HDR project pursues the objective of opening up geothermal potential largely independent of location. Bad Urach (Germany), Soultz Sous Forets (France), and Cornwall (UK) are under discussion as possible locations for a pilot plant.

Projects for developing HDR technology are also being carried out in the U.S. and Japan; the exchange of scientific information is to be increased. In the past 15 years, geothermal science has been funded by the BMFT with about DM75 million; in 1990 over DM6 million will be spent.

Geothermal energy has the potential to cover the energy requirements of mankind over very long periods. The potential of the top seven kilometers of the earth's crust, which can be reached using the current level of drilling technology, is so large that it seems worth exploiting more intensively. Geothermal power stations have been installed in over ten countries and contribute to supplying more than 3.2 million people. The total capacity of these power stations is currently around 5,800 MW (electrical) and 11,400 MW (thermal). In France alone some 200,000 apartments are being supplied with thermal energy from geological heating plants. Certainly the use of geothermal energy depends on geological and tectonic conditions, which are easier to evaluate at many

places abroad than in the Federal Republic, including Iceland, Japan, the Philippines, and the U.S.

**Environment Minister Seeks More Funds for Pollution Projects in Former GDR**

91MI0460X Bonn *DIE WELT* in German  
2 Aug 91 p 17

[Text] Federal Minister for the Environment Klaus Toepfer is still striving to bring environmental funding and protection to the new laender this year, in line with the West German standard. "Nevertheless," said the Minister yesterday in Berlin, "it will not be possible to remove all old sources of pollution in the former GDR within this period." He then handed over funds totaling 41.5 million German marks [DM] for eight environmental projects. With these funds, environmental investment in the eastern part of the city, totaling just DM100 million, will be possible this year. The main features of the measures funded, agreed upon by Bonn and Berlin, include making safe drinking water available, draining polluted waters, and surveying heavily polluted industrial and residential areas.

**Ecology Institute To Be Established in Leipzig**

91MI0457X Bonn *DIE WELT* in German  
13 Aug 91 p 19

[Text] An environmental research center for particularly polluted industrial areas in the Leipzig/Halle/Bitterfeld urban triangle was established yesterday in Leipzig. It is a joint effort involving the Federal Research Ministry, the land of Saxony-Anhalt, and the free land of Saxony. As the first large German research institute devoted exclusively to environmental research, the center will develop programs to clean up contaminated industrial land and reclaim mining sites, support the agricultural sector in introducing ecological farming methods, and demonstrate how environmental pollution in the air-soil-water interactive chain can be reduced through tropospheric research. Preliminary work on this has been performed by some 150 scientists from the former GDR Academy of Sciences and the East Berlin Agricultural Academy. The new center will begin operating at the beginning of 1992 and will later employ 400 people, which will be scientists. There are plans for the universities of Halle and Leipzig to share the existing research potential. Thus Halle-Merseburg will be involved in agricultural, geological, and biological science, in process technology and in environmental law, while Leipzig University will focus on analytical chemistry and urban ecology.

The Federal Republic will provide 90 percent of the funding (some 60 million German marks [DM] in 1992) and Saxony and Saxony-Anhalt 10 percent.

Federal Research Minister Riesenhuber was able to place top-ranking experts on the founding committee, which was established yesterday in Leipzig. Its eight members include the president of Berlin's Federal Environmental

Office, Von Lersner; Director of the Alfred Wegener Institute for Polar Research Alfred Hempel; the leader of the working group for theoretical ecology at the Juelich Research Center, Jacqueline McGlade, and the general director of the EC Commission, Pasella. Wolfgang Levi (GSF, Research Center for the Environment and Health in Munich) will serve as a consultant.

**Environmental Contamination From Soviet-German Wismut Uranium Mine Revealed**

91GE0430A Hamburg *DER SPIEGEL* in German  
Vol 45 No 34, 19 Aug 91 pp 58-64

[Unattributed article: "Yellow Cakes from Saxony"]

[Text] This summer white flags with the inscription, "New Thinking—New Action," are waving in front of the main building of the Wismut AG uranium ore company in Chemnitz, Saxony.

That will certainly be called for because the Soviet-German Wismut Ltd (SDAG) of which Economics Minister Juergen Moellemann (FDP [Free Democratic Party]) recently assumed full ownership from Moscow is responsible for one of the greatest ecological catastrophes in Europe.

Where the raw material for the Soviet nuclear bomb program was once mined, radioactive radon is escaping into the environment from 3,500 mountains of slag, 15 muddy containment tanks and 2,500 kilometers of subterranean uranium mine shafts running from Gera to Koenigstein. Experts estimate that 10,400 square kilometers of soil—an area four times the size of the Saarland—are contaminated.

An area in which some two million people live in southeastern Germany is endangered, if not already radioactive. Klaus Toepfer (CDU [Christian Democratic Union]), the German minister for environment, was appalled when he visited the disaster area last March. "It is totally incredible," he said.

Incredible perhaps—but true. In an interim report, the government Commission for Radiation Protection, a division of the Environment Ministry, has documented "the results of a data review" for the first time ever. The report provides evidence of previously unknown health problems among the company's staff.

Among other things, the experts seized a confidential file labeled "occupational illness—bronchial carcinoma" (BK 92). According to information contained in the file, 9,000 uranium miners were diagnosed as having contracted "lung or bronchial cancer" until 1990—probably caused by radon.

SDAG has now been forced to admit that 160 former miners are diagnosed as "new cases of lung cancer each year." The experts say that in all there are more cases of cancer caused by radiation in the southern areas of the former GDR among members of the Wismut staff alone

than among the survivors of Hiroshima and Nagasaki, the two Japanese cities subjected to American nuclear bombardment in 1945.

The diagnoses of the Wismut medical staff on classic lung diseases were kept secret for decades. Since 1952, the doctors found 15,000 cases of pneumoconiosis in 260,000 mass X-ray examinations. Six thousand more miners are "suspected" to be suffering from silicosis.

The pneumoconiosis file contains no information on how many deaths resulted from inhaling uranium dust but it does contain comprehensive "post mortem findings" from autopsies.

Werner Schuettmann, 77, an East Berlin doctor of internal medicine and an industrial health expert, says that the truth about the human victims of the GDR uranium mining program which was kept secret for 40 years shows how reckless the operation was. All customary safety precautions were "grossly neglected," says Schuettmann who dealt with the radon victims from Saxony and Thuringia both at the Karlshorst Clinic and as a member of the GDR radiation protection commission since 1961.

In the fifties, for example, SDAG Wismut sent tens of thousands of miners down into the shafts without protective gear. Initially, even women had to work underground in heavily radon-contaminated areas. These high-risk workers received privileged treatment in the distribution of food and consumer goods. Warnings by concerned GDR physicians and mining experts went unheeded by SDAG Wismut at that time.

The reason being that the company was engaged in fulfilling a mission of world political importance with insufficient means, i.e. the Saxon uranium mines were charged with mining the raw material for the Soviet nuclear bomb industry. Since the end of World War II SDAG Wismut produced some 220,000 tons of concentrated uranium—known as yellow cakes—from huge quantities of uranium ore.

The Soviet Union was already making use of the yellow cakes from Saxony when it conducted its initial nuclear tests in 1949. At the "armory of socialism," as it was called by the SED [Socialist Unity Party of Germany] propagandists, GDR experts produced the materials for the warheads of the nuclear missiles which Soviet armed forces deployed in the GDR. But the plant also produced uranium for the fuel elements of the GDR nuclear reactors at Greifswald and Rheinsberg.

The health risks for the population of the area was kept secret by the Wismut plant operators. The former State Office for Nuclear Safety and Radiation Protection (SAAS) of the GDR did conduct wide-ranging "area surveillance" as early as the eighties. Wismut geologists even used helicopters to determine radiation from new uranium ore fields on the ground some of which was greater than that following the Chernobyl disaster in the Soviet Union in 1986.

But according to Walter Roehnsch, 62, a former SAAS expert, the East German radiation observers were unable to come up with solid findings because of the military nature of the "facility." Roehnsch, now with the Berlin branch office of the Federal Office for Radiation Protection, cautions against exaggerating the dangers. "Nobody is going to drop dead just by walking around the area," he says.

That is a small consolation for the inhabitants of the villages in the "Uranobyl" area, as it was called in the Bonn Energy Report. The 370 inhabitants of the village of Oberrothenbach, for example, are told in an informal "health advisory" not to eat their homegrown carrots or tomatoes. At the foot of the uranium dump in Crossen, radon levels are 150 becquerels per cubic meter or almost 20 times higher than normal levels in West Germany.

In the houses of the historic mining region of the Erz Mountains radon levels are higher than anywhere on earth. Levels up to 100,000 becquerels have been measured at Schneeberg. Minister Toepfer recently appeared on television climbing into a basement pit which spewed uranium gas into the interior of a local building.

The radiation protection commission calls for "rehabilitation measures" even at a level of 250 becquerels. The ministry for the environment made 6 million German marks [DM] available to Schneeberg for repair work on the radon-infested buildings.

The experts disagree on whether there is a direct link between radon levels and the incidence of cancer. The chain of cause and effect is particularly difficult to trace because cancer caused by the waste products of radon 222 which affect the human lung in the form of alpha rays does not become active until approximately 35 years after exposure.

Because of this long interval scientists are not at all comforted by the fact that GDR experts did not determine marked increases in average cancer death rates of 209 per 100,000 inhabitants in the uranium region in the eighties. What is more, epidemiologists at the central cancer registry of the former GDR in Berlin say that these findings are not reliable in view of the fact that many illnesses in the vicinity of the uranium mines were hushed up for political reasons.

The evaluation of the cancer registry which lists more than 2.1 million cancer patients since 1953 also runs into legal difficulties. At this juncture, German data protection laws do not permit the creation or use of such patient data bases.

Conversely, the medical profession which might now gain access to the most comprehensive cancer registry in the world in terms of demographics sees a chance for unprecedented research projects. The Wismut example combined with comparison examinations might provide an empirical answer for the first time in medical history to the question of whether nutrition habits, smoking, or

natural sources of radiation contribute to the incidence of cancer. Spiros Simitis, 56, the recently retired Hesse data protection expert, says he can sense a "new gold-rush mentality" emerging among the medical statisticians.

But according to the experts in the environmental ministry there is no further need for statistical analysis. They say steps must be taken immediately to bring the radiation threat under control.

The question is how. Both in the unification treaty and the agreement on Wismut the Bonn government turned down Soviet participation in the cleanup. In the meanwhile, however, the estimated cleanup costs have jumped from DM5 billion to DM15 billion—or DM10 per square meter of contaminated soil.

Canadian and Australian uranium experts have already had a look at what once was the third-largest uranium-producing region in the world. A cleanup project of this magnitude has never before been attempted. For the special purpose of devising potential technologies, Wismut AG and the French nuclear firm of Cogema have formed a decontamination, cleanup, and recultivation company.

"We are all astonished at the magnitude of uranium production in the former GDR," says Wolfgang Kersting, the general manager of Interuran, Saarbruecken. Western cleanup experts have thus far only been able to work on relatively small, inactive uranium mines in the Fichtel Mountains of Upper Franconia or the Black Forest.

"Why should we repeat the mistakes which others have already overcome," says Klaus Martignoni, an expert at the Office for Radiation Protection. To analyze the data from Wismut, the experts are calling for an "international Wismut hearing" with the participation of scientific critics such as took part in the Gorleben hearing at Hannover in 1979 on the storage of nuclear waste. The Bonn Environment Ministry, which is responsible for radiation protection, views such a Wismut hearing "with favor."

Wismut AG would like to see the radioactive waste put back where it came from, i.e. underground. About 6 million cubic meters of decontaminated rubble and scrap material from the dismantled plant buildings could be sunk into underground silos. The cleanup experts would like to dump the cone-shaped piles of uranium ore which can be seen from faraway into the Lichtenberg strip mining pit near Ronneburg in Thuringia. The pit which is 140 meters deep could provide space for 80 million cubic meters of uranium material. "That is our preferred option," says Wismut spokesman Johannes Boettcher.

There is not only a great deal of opposition among the population to the cleanup plan which is to be made public in Bonn in early September. The Oeko Institute in

Darmstadt has analyzed the weak points of the underground project on behalf of the environmental organization, Greenpeace. Test drillings have uncovered "geological danger zones" at the edge of the mud lakes.

Uncontrollable water seepage poses the threat of "large-scale leaching" of radioactive material which will still be radioactive in 1,600 years. The poisonous arsenic levels in the Wismut lakes would be sufficient in themselves to poison all of Europe. For all that, water seepage is by no means inconceivable. If water levels which are artificially lowered underground at present were to rise, the mine shafts and pits would be flooded.

For the sake of comparison the Darmstadt scientists drew on the cleanup rules established by U.S. environmental protection authorities following their experiences with deactivated uranium mines in Utah, New Mexico, and Arizona. According to these regulations the Wismut project would not be licensed to operate. U.S. operators, for example, must submit a "certificate of impermeability" for at least 200 years. But even secure encapsulation would not do away with the problems at Wismut in view of the fact that materials for the construction of houses and roads were removed from the Wismut dumps in years past. As in the case of the contaminated red gravel used on West German sport fields and play grounds, no one knows where the radioactive materials were used.

Environmental investigators recently struck paydirt at the Hermsdorf interchange south of Leipzig where an entire freight train full of Wismut waste material was used to build the foundation of an Autobahn segment.

## IRELAND

### Study on Economic Impact of Acid Rain Controls Released

91WN0670A Dublin *IRISH INDEPENDENT*  
in English 26 Jun 91 p 11

[Article by Tony O'Brien, Environmental Correspondent]

[Text] Action to end acid rain caused by sulphur emissions from the ESB's Money point plant could cost £180m and put an extra four percent on consumers' electricity bills, according to a new study.

And the Government is being warned to think carefully about measures to improve the quality of our environment which could end up costing the country a lot of money.

In a major study of the economic impact of acid rain controls, the Economic and Social Research Institute (ESRI) says: "Environmental actions will only be sustainable in the long term if they have neutral implications for the Exchequer's finances."

The lessons for Irish policymakers from the study, it explains, is that environmental objectives need to be clearly specified and coordinated before commitments to action are made. It also has to be decided whether Ireland wants to take costly action on its own or take part in more cost-effective, Europe-wide measures.

While there is growing concern about environmental problems, says the study's author, Daniel McCoy of the ESRI, relatively little attention is given to the economic implications of environmental policy.

Dealing with the problem of acid rain, Dr. McCoy points out that in Ireland this principally affects the ESB and its power generation. Under the Helsinki Protocol of 1985 Ireland has agreed to a reduction in sulphur emissions.

But to meet the limits set, the ESB would have to install "scrubbers" at the coal-fired Money point station to clean up the emissions. Dr. McCoy estimates these would cost L150m, with a once-off L30m in extra fuel costs during installation.

The operating cost of the "scrubbers" would be L15m each year, with the expected economic life of the equipment being 10 years. It is assumed that the ESB would have to borrow the L180m abroad which would cost the company about L44m a year without generating any additional revenue.

"In order to raise the revenue to finance the investment, electricity prices would need to increase by about four percent per annum above the central forecast", points out Dr. McCoy.

Another strategy to cut the Money point emissions would be to use a combination of low sulphur coal and natural gas. This would result in only a one per cent increase in electricity prices.

Dr. McCoy adds: "The economic cost of unilateral action on environmental issues, such as the control of sulphur dioxide and carbon dioxide emissions, is much greater than for multilateral action. If Ireland adopts stricter limits than do our major trading partners, this increases domestic costs and affects competitiveness."

## ITALY

**Industrial Waste Polluting Milan's Water Supply**  
91WN0677A Milan L'EUROPEO in Italian 2 Aug 91  
pp 74-75

[Article by Fabrizio Filosa: "A Nice Glass of Dirty Water"]

[Text] Thirty percent of the wells that supply the Milan aqueduct have been shut down because they are polluted by chemicals. Here is who is responsible for the water emergency.

When you are parched by the heat of this torrid summer, the most rewarding thing we wish for is a glass of cool,

pure, crystal clear water. Nowadays, however, it is not always easy to get one. In fact, for the people of Milan and many towns in Lombardy, it is almost impossible. For years now, the water that comes out of Milan faucets has no longer been "odorless, colorless, and tasteless"; instead, it is contaminated by a long list of chemicals. And the situation has gotten worse during the past few weeks. At the beginning of July, the number of wells of the Milan aqueduct that were closed down as a result of pollution reached a record 158 out of 533, that is, about 30 percent of the total, which has created problems of supply in some areas of the city. Even in the province, the situation is not good; no wells have been closed because of pollution, but water is in short supply in many towns.

"Until a few years ago Milan's very abundant groundwater provided a very pure water—better than any mineral water. Today, the quality of this water has been destroyed chiefly by industrial wastes," explained Floriano Villa, president of the National Association of Geologists, who for many years has been denouncing the ruinous state of the groundwaters in our territory. "But that is not all; the responsibility rests also with our administrators, who have never implemented a policy of prevention and control to save a resource as precious as water."

Unfortunately, the water situation in the capital of Lombardy is even worse than the figures show. Most of the water drawn from the wells continues to be drinkable only by decree. According to Law 236 of 1988, which adopted an EC directive, the concentration of chlorinated solvents, such as tetrachloroethylene, trichloroethylene, chloroform, and carbon tetrachloride, should not have exceeded 30 micrograms per liter as of 8 May 1991. But on that date, about one half of the 30 centers of the Milan aqueduct were supplying water in which these solvents amply exceeded that limit. Only a last-minute extension decided on by Minister De Lorenzo (Health) and Minister Ruffolo (Environment) made it possible to ward off the danger of thirst. Without this derogation, which increases the maximum limit to 60 micrograms and grants three years to bring down the concentration of solvents below 30 [micrograms], today there would be about 220 closed, around 40 percent of the total.

The list of polluted wells reads like a war bulletin: 52 are closed because of chlorinated solvents; 54 because of atrazine, a weed killer; nine are closed because of substances that give off a foul smell; three because of triethylphosphite; one because of hexavalent chromium; one because of manganese; 20 because of a pollutant never found before: 3-6 cloropiridazina, an antirheumatic drug. "Another 15 wells that were in good shape have been shut down to reduce the content of dangerous solvents in the water at the pumping stations," explains Enzo Zampieri, the engineer who is manager of the Milan aqueduct.

When speaking about responsibility, Floriano Villa becomes more intense: "Milan's groundwater comes from

the Alps and flows underground along a line that runs from north-northwest to south-southeast. Therefore, in order to safeguard the purity of the Milan reservoir we must avoid the leaching of poisons in the band of territory north of the city. In 1954, it was already recommended to the Milan City Council not to allow the establishment of industry in that critical area. But this was to no avail. Today all the industries are up North, and this is what has caused the disaster. In the absence of controls, the industries have become hotbeds of pollution. For decades, they have poured poisons onto the ground, and above all, they have drilled hundreds of waste wells. Holes that are tens of meters deep, into which wastes are dumped that end up directly in the groundwater. Up until the 1960's, this approach was recommended by some provincial administrations. The problem is that many waste wells are still open, and pollutants of all kinds continue to seep out of them into the groundwater, perhaps even carried by rain water."

There are few remedies for such cases. The only solution that works is to find and eliminate the sources of pollution. If the poisons no longer seep in, the Milan groundwater can very rapidly purify itself, given the enormous quantity of water that flows underground. Instead, most of the remedies are attempted downstream. This was confirmed by Enzo Zampieri. "To clean up a groundwater system is a long, difficult, expensive undertaking, and success is not always guaranteed. One of the ways is to 'purge' the wells, that is, to pump out the water and dump it into sewers, hoping in this way to slowly eliminate the pollution. Whether this works or not, this purging, in any event, causes the flow of pollutants to be drawn toward a single point, and thus, saves other wells," Zampieri points out.

But a lot more is needed to solve the problem within the three years allowed by the prorogation of the law. "For instance, we are looking for new wells that can provide clean water inside the city and outside," said Riccardo Airoldi, who is in charge of the pumping systems at the Milan aqueduct. "But there is always the danger that some new kind of poison will pop up. Until a few years ago, the agricultural areas seemed to be ideal, but then they discovered that the water was contaminated by pesticides. Anyhow, it is not a fast job. To find and activate a well takes a lot of time."

Some projects have also been undertaken to deepen the wells so they can reach water that is still unpolluted at depths of up to 190 meters. But the cure could prove worse than the illness because the pockets of the groundwater system are interconnected, and pumping water at greater depths could accelerate the downward leaching of the pollutants. Furthermore, at those depths there is the risk of finding a high percentage of hydrogen sulfide dissolved in the water, which would still be drinkable, but very smelly.

In coming months, the first large groundwater filtering plant will be put into operation. It will use granulated active carbons; these are compounds that can filter out

chlorinated solvents and pesticides. This plant is attached to the Vialba waterworks north of Milan and will cost about 1.5 billion Lire for the building and for the purchase of the carbons. It will be capable of purifying from 400 to 600 liters per second, that is, as much water as 10-15 wells can provide. This is not much, considering that Milan uses 10-12 thousand liters per second. "It is a very expensive system that serves little purpose," says Flori and Villa. "It takes out mostly the chlorinated solvents, but the groundwaters contain almost everything, from cyanides to medical drugs."

Not even the people at the Milan aqueduct are enthusiastic about this solution. In fact, Zampieri says: "Carbons do not even stop all the chlorinated solvents; in fact, chloroform gets through. And then at the end of the treatment, it is necessary to chlorinate the water because these filters are an ideal substrate for the proliferation of microorganisms. Finally, carbons have a limited duration and need to be regenerated often."

According to Villa, the major charges against the administration are that they never seriously sought out the sources of pollution and, in the past, did not have maps drawn of groundwater vulnerability. "These maps would have helped understand in which areas they should have avoided the settlement of industries that could have endangered the underground water resources," Villa says. "And now these maps could be of use to us to know which areas can provide clean water." As if this weren't enough, very severe limitations on the nitrate content in the water will become effective on 31 December. From this point of view, Milan is in good shape. But the same is not true of many Lombard towns. As for the nitrates (that come from fertilizers), there is no solution: no filter stops them.

## SWEDEN

### Expanded Use of Waste Combustion as Alternate Energy Source Viewed

91WS0477X Frankfurt/Main *FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT*  
in German 11 Jul 91 p 8

[Article: "Sweden Hopes To Expand Use of Waste Combustion for Energy Gain: Residue Can Be Used as Building Material; Increased Acceptance by Population"]

[Text] Frankfurt, 10 July—Instead of dumping paper and packing waste on already towering mountains of trash, Sweden is considering the development of special power stations for used paper, and even today far more than half of the annual domestic waste total of just on 3 million tons is being burned in 23 central-heating plants. If we compare this with the old federal Laender of Germany; here 70 percent of domestic waste ends up on the dump.

In contrast to the FRG, Sweden has virtually no natural gas. The Swedes use waste combustion at least in part to decrease their dependence on oil and coal. Since, according to data from the Swedish paper firm Stora, two tons of packing material correspond to one ton of oil, and almost 40 percent of household waste by weight consists of paper trash. Swedes are already heating 250,000 homes with thermal energy from household waste.

The largest of the 23 waste combustion plants, with a burn capacity of over 200,000 tons annually, operate in Uppsala, Goteborg, Malmo, Linkoping, and Stockholm. Goteborg, which already provides 60,000 homes with hot water and 30,000 with electricity, hopes to double its burn capability by 1994, expanding it to 400,000 tons annually. The city of Uppsala has been meeting 95 percent of domestic heat demands from waste combustion. Because the waste production of the Uppsala community, numbering only 160,000, is too small. Other communities within a range of 75 km deliver their wastes to the energy-providing firm of Uppsala Energi AB. Last year, the firm paid the equivalent of 12 German marks [DM] for a ton of waste, depending on the degree of presorting, but today they pay only about DM4. Starting in 1992, the communities will even deliver their waste free of charge, because it saves disposal costs. Households connected to the central-heating plant network, approximately 110,000 persons, profit from the reduced running costs.

After initial opposition, the Swedish populace is also accepting waste combustion. According to claims by Lars Astrand, business manager of the Uppsala Energi company, even the Swedish Greens now support it. The Swedish wood processing industry, i.e., the producers of cellulose, paper and packing, favor household waste combustion, if only because the high proportion of paper and packing wastes contained in it, along with all kinds of nonrecyclable used paper, produce a valuable biological fuel. After all, a fiber of paper can only be recycled approximately three or four times, even with a corresponding reduction in product quality.

A VDI [Union of German Engineers] conference on questions of waste combustion recently held in Essen also concluded that waste combustion plants reduce the volume of waste yield to approximately one-tenth, eliminate the danger of large-scale distribution of toxins which other processes entail, and exploit the energy released to provide electricity and central heating plants. In the process, approximately 200 kg of mineralized and reusable ash, which can function as a building material, is produced by every ton of waste.

The waste combustion plant in Uppsala, for example, sells significant amounts of residue annually as a building material. The heavy metals, salts and fine toxic dust produced in domestic waste combustion can now be processed to the point that from a ton of household waste the residue which has to be disposed of by other means

comes to no more than 3 kg. The emissions guidelines for new waste combustion plants are just as strict in Sweden as in the FRG.

## UNITED KINGDOM

### Electromagnetic 'Smog' Sends Robots Out of Control

91WN0669A London *THE DAILY TELEGRAPH* in English 9 Jul 91 p 7

[Article by Roger Highfield, science editor]

[Text] Electronic "smog" has been blamed for sending shop-floor robots out of control to injure or kill workers, according to the head of a new Atomic Energy Authority [AEA] facility to measure electromagnetic radiation given out by electrical goods such as electric drills or computers.

The problem of electronic pollution can sometimes pose a higher risk to humans than emissions from factory chimneys, said Mr. David Whitworth, Electromagnetic Compatibility Manager for AEA Technology.

He said that in a case reported from Japan a worker had been killed when robots on a production line were affected by stray electromagnetic emissions.

"Emissions from equipment like cellular telephones, portable radios and pagers are filling the atmosphere with what amounts to an invisible electromagnetic smog," he said.

It is estimated that 70-80 percent of electrical goods sold in Britain are emitting unacceptable high levels of electromagnetic radiation.

Many householders are familiar with the resulting "pollution", as light switches and electric drills affect TV pictures or home computers, or CB radio causes interference to radio and hi-fi.

But the stray signals can also interfere with heart pacemakers and there have been reports of deaths.

"When machines start to interfere with each other, there is potential for all kinds of chaos," said Mr. Whitworth, who cited a case of electronics in an experimental aircraft malfunctioning when it approached a transmitter.

There is increasing dependence on electronics to control safety systems such as those found in "fly-by-wire" aircraft.

On the eve of a British Standards Institute conference on the issue today in London, AEA Technology announced the launch of a £350,000 test chamber at Culham in Oxfordshire, in which the emissions of electrical goods are tested.

Products are also bombarded with electromagnetic radiation to test their susceptibility to radiation.

Mr. Whitworth said AEA Technology hoped to encourage British manufacturers to bring standards into line with German, French, Italian, Japanese and American manufacturers.

**Pesticide Poisoning Cases Said To Decline**

*91WN0663A London THE DAILY TELEGRAPH  
in English 17 Jul 91 p 20*

[Article by David Brown, agriculture correspondent]

[Text] The number of pesticide poisoning incidents fell last year as safety inspectors stepped up prosecutions against farmers for breaches of regulations to protect people and the environment.

Although there were fewer complaints from the public, chemical sprays drifting over people and adjoining property still caused concern, the Health and Safety Executive said yesterday on the first day of the East of England Show at Peterborough.

The number of pesticide incidents investigated on farms for the year up to April fell to 175, compared with 201 in 1989-90, and the number of complaints of poisoning fell from 104 to 102.

The executive made 34 prosecutions, more than twice the number of the previous year, resulting in average fines of £475.

Mr. Carl Boswell, chief agricultural inspector, said: "This shows that inspectors are prepared to use the full extent of their powers."

An easier cattle judging schedule introduced at the show yesterday gave beef breeds the rings to themselves, with dairy breeds due to take their turn today.

The change, which requires stockmen and cattle in each section to spend only two days at the show, has been forced by farmers unable to neglect essential work at home for most of the week.

**Banned Toxic Chemicals Found in Upland Area Birds' Eggs**

*91WN0671A London THE DAILY TELEGRAPH  
in English 29 Jul 91 p 4*

[Article by Charles Clover, Environment Editor]

[Text] Banned toxic chemicals and pesticides have been detected in the eggs of two birds of remote upland areas, the dipper and the grey wagtail, according to a Cardiff University study.

The birds analyzed were confined to areas widely considered unpolluted—Wales, east Scotland and southwest Ireland—indicating the persistence or illegal use of the banned chemicals.

The study, carried out with the Royal Society for the Protection of Birds, found that eggs contained traces of PCBs (polychlorinated biphenyls), DDT, Dieldrin, and mercury most in significantly higher traces in Scotland. Dr. Steve Ormerod, author of the study said: "Dieldrin residues were highest in areas of Wales with high sheep densities and are probably a legacy of the use of this chemical in sheep dip.

"The occurrence in Scotland of the banned chemical DDT indicates recent use which would be illicit."

Dr. Stephanie Tyler, RSPP conservation officer for Wales said: "The levels we found showed just how widespread contamination by persistent chemicals can be even after these chemicals have been banned from manufacture or use throughout Britain and the EC."